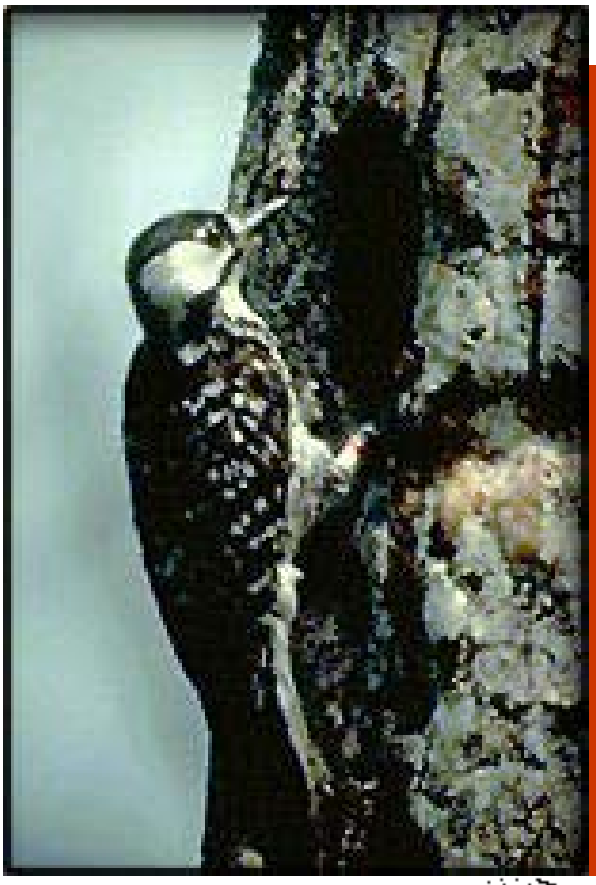
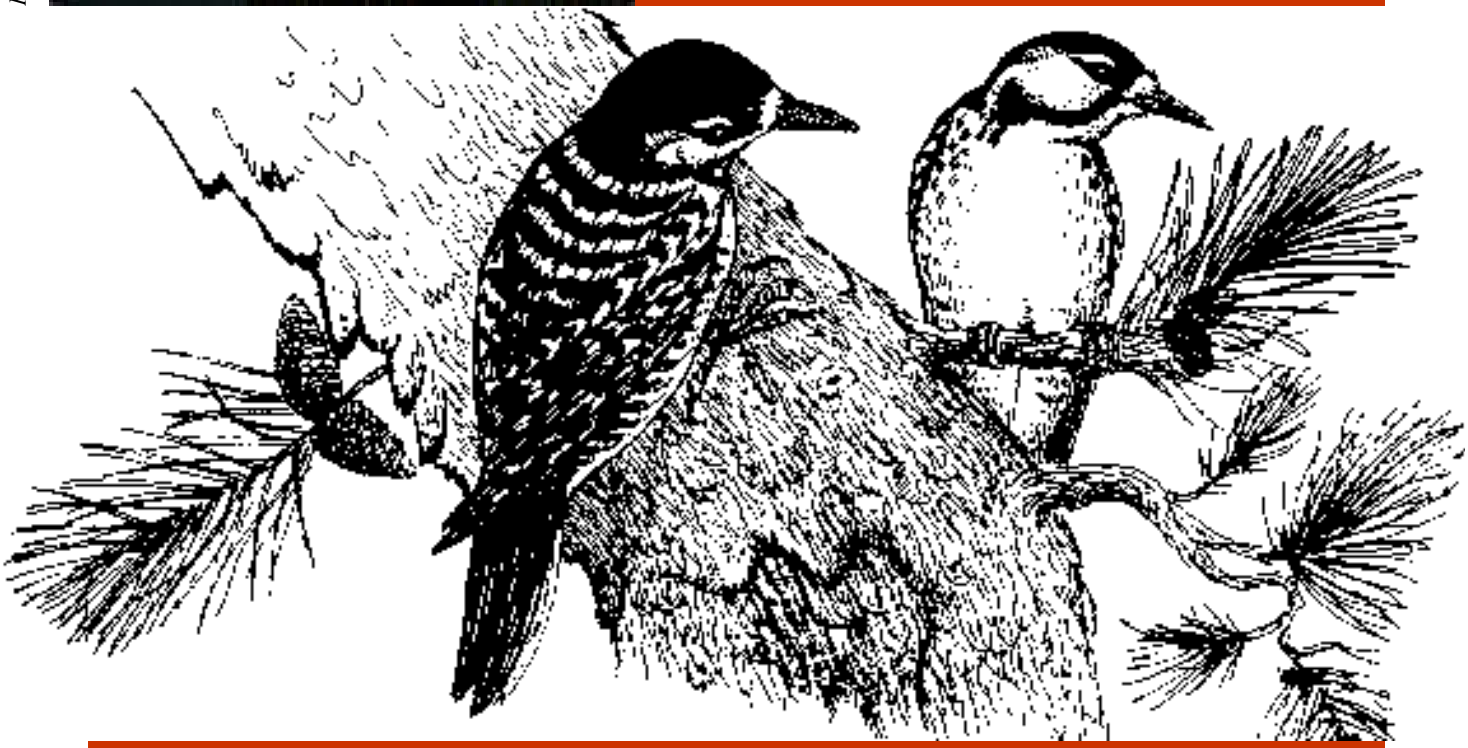


Photo Credit: U. S. Fish and Wildlife Service; USFWS/Line Art by Robert Shallenberger

RED-COCKADED WOODPECKER HABITAT AND CANEBRAKE RESTORATION PROJECT - COMP 7, 9, 10

30 Day Comment Draft
Environmental Assessment

January 2007



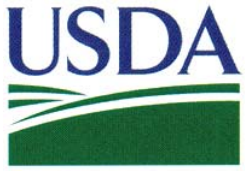
U.S. Department of Agriculture, Forest Service
Chattahoochee and Oconee National Forests

Red-Cockaded Woodpecker Habitat and Canebrake Restoration Project- Comp 7, 9, & 10

Draft
Environmental Assessment

Chattahoochee and Oconee National Forests
Jones County, Georgia

January 2007



U.S. Department of Agriculture
Forest Service

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ACRONYMS AND ABBREVIATIONS

BA	Basal Area
BMP	Best Management Practice
CAA	Clean Air Act
CCF	100 Cubic Feet
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FSH	Forest Service Handbook
FSM	Forest Service Manual
GDNR	Georgia Department of Natural Resources
GNHP	Georgia Natural Heritage Program
HMA	Habitat Management Area
KV	Knutson-Vandenberg
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PILT	Payments in Lieu of Taxes
PETS	Proposed, Endangered, Threatened, and Sensitive
RCW	Red-cockaded Woodpecker
ROD	Record of Decision
SHPO	State Historic Preservation Officer
SIO	Scenic Integrity Objectives
SPB	Southern Pine Beetle
TMDL	Total Maximum Daily Load
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WMA	Watershed Management Area

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1.0 INTRODUCTION

This environmental assessment (EA) documents the results of a study of the potential environmental impacts of actions proposed by the United States Department of Agriculture (USDA), Forest Service (USFS) to restore habitat needed for the recovery of the Federally listed, endangered red-cockaded woodpecker (RCW) (*Picioles borealis*) on the Oconee Ranger District of the Chattahoochee-Oconee National Forest in Georgia. It also documents the effects of proposed actions designed to restore rare canebrake communities important for species such as the Swainson's warbler (Limnothlypis swainsonii).

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for Federal Actions having the potential to impact the quality of the human environment; the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500 through 1508) for implementing NEPA; Forest Service Procedures for Implementing CEQ regulations (Forest Service Manual (FSM) Chapter 1950); and the Forest Service Policy and Procedures Handbook (Forest Service Handbook (FSH) 1909.15).

A key objective of NEPA is to help Federal agency officials make well-informed decisions about agency actions. The District Ranger on the Oconee National Forest is faced with a decision as to what, if anything, the USFS should do to restore habitat for the RCW within the Sub-Habitat Management Area on the Oconee National Forest to aid in the recovery of the species. Additionally, what, if any, actions should be taken to restore rare canebrake communities important for Swainson's warblers and other species within the project area. This decision will be made within the overall management framework already established in the:

- *Land and Resource Management Plan for the Chattahoochee-Oconee National Forests* (Forest Plan, signed January 2004), and its accompanying EIS and Record of Decision (ROD);
- *Vegetation Management in the Coastal Plain/Piedmont Final EIS* (Volumes I and II) *and Supplement*; and
- *Revised Red-Cockaded Woodpecker Recovery Plan* (Recovery Plan, signed January 2003), prepared by the United States Fish and Wildlife Service (USFWS).

The Forest Plan, EIS, and Recovery Plan establish overall rules and guidance for actions taken within the Oconee National Forest. Therefore, the alternative courses of action considered in this EA were crafted to be consistent with the concepts established in the above documents.

1.1 BACKGROUND

The RCW is endemic to open mature pine ecosystems in the southeastern United States. Due to a nearly complete loss of habitat, and subsequent extreme decline in population size, the RCW was Federally listed as endangered in 1970. Currently, less than three percent of the species'

former population size exists (USFWS, 2003a). The Oconee National Forest (including the Hitchiti Experimental Forest) and the adjacent Piedmont National Wildlife Refuge both contain remnant RCW populations and the potential to support many more clusters, or family groups, of these woodpeckers.

In 1995, the USFS, Region 8 ROD for the *Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region* EIS directed National Forests to delineate Habitat Management Areas (HMAs) to support the recovery of the RCW. The management direction on the Oconee National Forest designated 52,966 acres of the Forest as a HMA for the RCW (USFS, 2001).

According to the revised RCW Recovery Plan, the Oconee National Forest and Piedmont National Wildlife Refuge together make up one secondary core population of RCW, referred to as the Piedmont Recovery Unit. The plan defines a secondary core population as "a population identified in recovery criteria that will hold at least 250 potential breeding groups at the time of and after delisting." In 2000, the Piedmont Recovery Unit had 59 breeding pairs—20 on the Oconee National Forest and 39 on the Piedmont National Wildlife Refuge (USFWS, 2003a). The Oconee National Forest currently has 25 cluster sites. The FY 2006 surveys showed that 14 of these sites were active. To bring the RCW population in the Piedmont Unit up to the recovery objective of 250 breeding pairs, the USFS has developed a recovery program in accordance with the objectives and direction provided in the revised RCW Recovery Plan (January 2003). As part of this recovery program, the USFS, in coordination with the USFWS plans to translocate (bring in adult birds from another population) RCWs from a population with an excess number of birds to repopulate proposed habitat sites on the Oconee National Forest. In order to successfully translocate RCW breeding pairs, the proposed translocation sites must have suitable RCW foraging and nesting habitat. This habitat can be obtained by vegetation manipulation and other silvicultural methods.

As a result of several lawsuits dating back to the early 1990s, the Chattahoochee-Oconee National Forest has had to withdraw a number of projects and timber sales on the Forest, which has affected the ability to meet certain natural resource objectives. In addition, several needed resource management activities on the Forest have not been conducted in recent years due to lack of appropriated funds or not being eligible for KV (Knutson-Vandenberg) dollars. With the exception of a few activities to address the southern pine beetle (SPB) and some prescribed burning, there has been no active management to address RCW habitat needs on the Oconee National Forest between about 1998 and 2004. Implementation of the Red-Cockaded Woodpecker Habitat and Canebrake Restoration Project #1 (Caney Creek #1 & 2 timber sales in compartments 5, 6, and 8) is currently underway, with vegetation treatments scheduled to begin in January 2007.

1.2 PROJECT AREA DESCRIPTION

The project area is located on the Oconee Ranger District of the Chattahoochee-Oconee National Forest in Jones County, Georgia, approximately 18 miles southeast of Monticello (see **Figure**

1.2-1). The project area is located within a RCW Sub-HMA and encompasses approximately 1,160 acres of National Forest Service land located on the Hitchiti Experimental Forest within Compartments 7, 9 and 10. These compartments were chosen for this project as the district has been working eastward at implementing projects to create a more contiguous block of suitable RCW habitat. Field implementation began in 2004 in compartments 1 and 2 along the western edge of the Hitchiti Experimental Forest, and with current projects going on in compartments 5, 6, and 8, the natural progression was to proceed east into compartments 7, 9, and 10. The project area has been treated with periodic prescribed burning by the USFS since the early to mid-1980s for the purposes of hazardous fuels reduction and wildlife habitat improvements, and will continue to be prescribed burned in the future. These stands have been substantially impacted by SPB with concurrent salvage/sanitation operations ranging in size from an acre to 20 acres. Some of these stands were replanted with loblolly pine and others were naturally regenerated. There has not been any thinning done in these stands in at least the last 15 years. Compartment 10 currently has RCW cluster sites, while Compartments 7 and 9 do not. The project area currently consists of 71% pine sawtimber stands and 29% pine poletimber stands, in addition to the hardwood drainages.

The project area (Compartments 7, 9 and 10) comprises 6% percent of the sixth level Hydrological Unit Code (HUC) #030701031305 watershed. Land administered by the Piedmont National Wildlife Refuge comprises 45% percent of the watershed with private ownership making up the remaining 49% percent of the watershed. Private land uses in the surrounding area of Jones County include 84% forested, 14% agriculture, and 2% urban. In the immediate vicinity of the project area the 2% urban does not really apply, as forest land and agriculture dominate the landscape.

Project Area in the Hitchiti Experimental Forest
Oconee National Forest

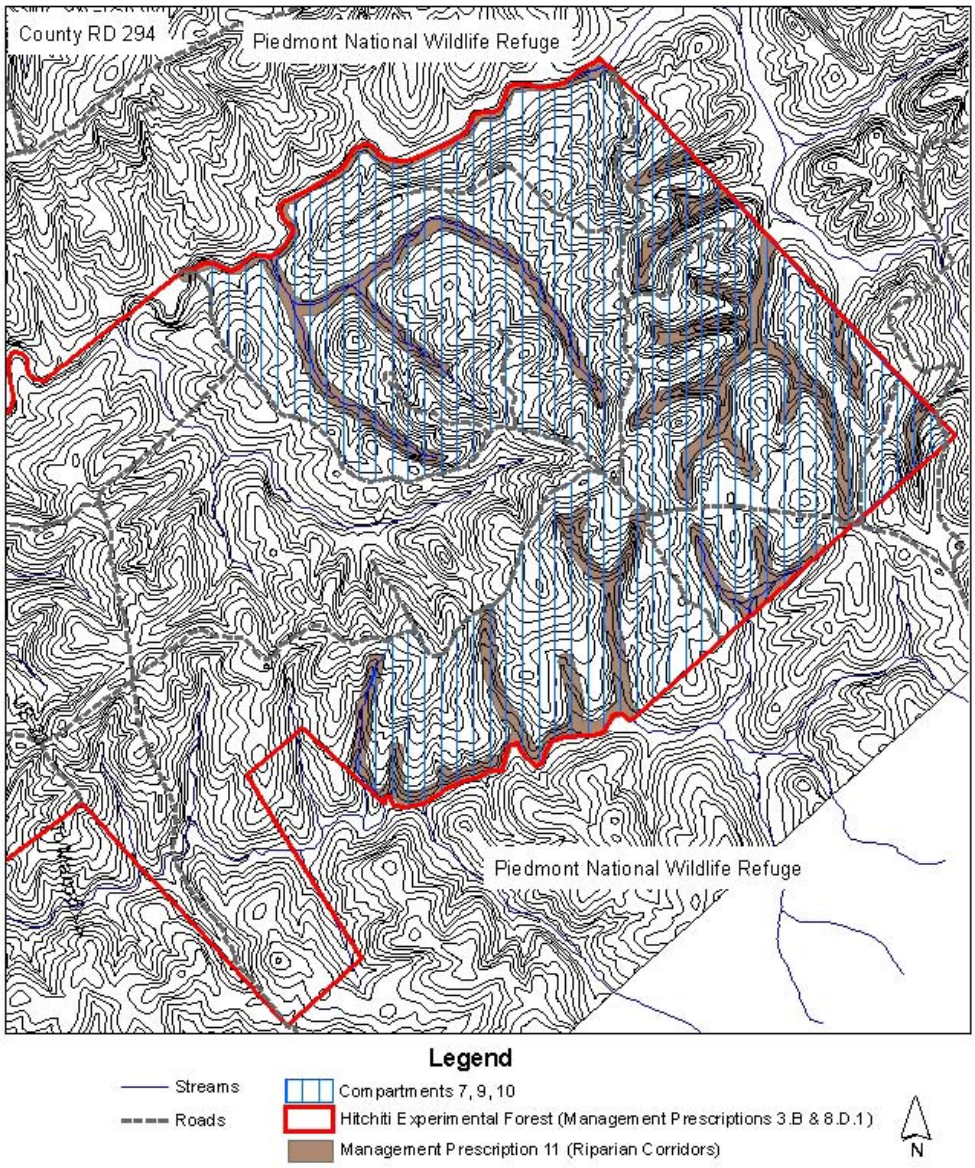

Figure 1.2-1: Location of the Project Area

1.3 PURPOSE AND NEED FOR ACTION

Under the Endangered Species Act (ESA), there are legislative requirements to positively manage for endangered species like the RCW on Federal lands. A prime objective of the Oconee National Forest is to comply with the ESA by providing habitat for the recovery of the RCW by restoring and managing a pine ecosystem, which furnishes preferred habitat for RCW foraging and nesting.

Existing habitat is not suitable for the RCW within the project area on the Oconee National Forest. A majority of the pine stands within the project area have excessive amounts of pine stems beyond the preferred habitat requirements (see Revised RCW Recovery Plan). Desired habitat is between 40 and 70 basal area (BA), while current stand information within the project area shows basal areas over 90. Thus, at present, stands do not provide the open park-like conditions that the RCW needs for suitable habitat. In addition, the RCW cluster sites and foraging habitat have suffered attacks by southern pine beetle due to the dense vegetation (Goal/Objective 8D/05, hazard reduction). RCWs require open areas of mature pines 60 years and older for nesting. Foraging habitats vary in age, but usually areas that are pine savannas with little, if any, midstory of hardwood (USFWS, 2003a).

The Hitchiti Experimental Forest designated as Management Area 3.B in the Chattahoochee-Oconee Forest Plan is located within the RCW Sub-HMA and must comply with RCW management direction (USFS, 2004a). The management of the RCW is currently listed as Goal 51 and Management Prescriptions 8.D and 8.D.1 in the Chattahoochee-Oconee Forest Plan (USFS, 2004a). Desired conditions for the RCW are stated here. The Oconee National Forest is not currently meeting these desired conditions. Under the ESA and RCW Recovery Plan, the Forest RCW population has been declared a Recovery population and the Forest is mandated by law to bring about this recovery. Habitat management is clearly necessary for the recovery of the species and therefore meeting the purpose and need.

Canebrake is considered a rare community in the Forest Plan. Goal 44 directs the identification and delineation of rare communities and then incorporates them into management prescriptions. Objective OBJ-9.F-05 establishes the need to restore 15 acres per year of canebrake on the Oconee NF. Canebrakes are important habitats for a number of species. Canebrake restoration will occur on sites currently supporting cane. Such sites can be found along Caney Creek which forms the northern border of the project area and in a small drainage in Compartment 7. Currently the canopy in the hardwood riparian areas where this canebrake exists is too dense to allow the canebrake to thrive. The dense canopy is shading out the canebrake and also prevents the leaf litter from drying out enough to burn periodically when the surrounding area is burned on a rotational basis. Occasional back burning will encourage propagation to allow new shoots to form. The desired future condition is an overstory hardwood stand of 40 sq.ft. of basal area with thriving canebrake underneath, while currently the basal area is 85 sq.ft.

1.3.1 Summary of Proposed Action

The following is a general description of the Proposed Action (Alternative 2). A more detailed description of each activity and connected actions can be found in Section 2.2. The applicable Chattahoochee-Oconee Forest Plan objective is shown in parenthesis with each activity.

a) Thin approximately 514 acres in Compartments 7, 9 and 10 (Objective 8.D-08)
b) Shelterwood harvest on approximately 80 acres. Majority of sites were previously impacted by SPB mortality (Objective 8.D-01)
c) First time thinning on approximately 254 acres (Objective 8.D-08)
d) Conduct prescribed burning of approximately 1160 acres within recruitment stands to control midstory vegetation (Objective 8.D-06)
e) Develop thirty 10- to 20-acre RCW recruitment sites (artificial cavity inserts and midstory control) approximately ¼ to ½-mile apart (USFWS guidelines) in Compartments 7, 9, and 10 (Objective 8.D-02)
f) Create 120 RCW artificial cavities (at least 4 cavities for each RCW recruitment site) (Objective 8.D-03)
g) Use and maintain existing road system (Objective 49.1)
h) Construct approximately 1 mile of temporary roads (Objective 49.1)
i) Reopen approximately 4.5 miles of temporary roads and associated log landings within the project area to access timber stands (Objective 49.1)
j) Reforest approximately 131 acres (includes 80 acres of shelterwood harvest listed previously) of old SPB damaged stands scattered throughout the project area with pine seedlings (Objective 8.D-09)
k) Restore 15 acres of canebrake along Caney Creek and another drainage in Compartment 7 by reducing overstory shade through girdling. The girdled trees will be left in place. (Objective 9.F-05)
l) Control coppice sprouting and release pine regeneration using herbicides in SPB spots, to insure survival of pine seedlings. (Objective 40.1)
m) Gully restoration on approximately 3 acres by terracing and establishing vegetation. (Objective 24.1)
n) Use a combination of herbicides and mechanical methods to control noxious weeds (kudzu and privet) and midstory vegetation on approximately 800 acres (Objective 40.1)

1.4 DECISION FRAMEWORK

Given the purpose and need, the Responsible Official (Oconee District Ranger) will review the Proposed Action and the other alternatives in order to make the following decision:

- Select the No Action Alternative (deferring action); or
- Select an action alternative; or
- Select a modified action alternative.

Should a decision be made to select an action alternative or a modification of an action alternative, the actions are planned for implementation in the next five years.

1.5 PUBLIC INVOLVEMENT

Public involvement during the NEPA process includes, at a minimum, public scoping, public review of the EA, and responses to comments submitted by the public. In accordance with CEQ's regulations for implementing NEPA, the Forest has involved the interested and affected public during the preparation of this EA.

On June 29, 2006, a scoping letter explaining the proposal to improve the habitat for RCW to meet the requirements of the Recovery Plan and RCW EIS with site specific information was mailed to 73 individuals and organizations that had previously expressed interest in the management of the Oconee Ranger District. In addition, the proposed action appeared in both print and Internet versions of the quarterly Scheduled of Proposed Actions for the Chattahoochee –Oconee National Forest in Georgia 2006. A legal notice requesting comments was also published in the *Eatonton Messenger* in June 2006. Three written responses were received during scoping and all responses were in favor of the project.

The purpose of the scoping process is to determine the scope of issues to be addressed in the EA and to identify major or key issues relating to the Proposed Action. On July 13, 2006, the Oconee RD invited all cooperating agencies (Federal and State), conservation groups, environmental organizations, such as Georgia Forestwatch and the Sierra Club, and the general public, to an open house to discuss and answer any questions about the project. The Georgia Department of Natural Resources and the U.S. Fish and Wildlife Service attended this open house. On July 26, 2006 the Oconee RD met with the Georgia Department of Natural Resources, USDA Forest Service Southern Research Station, and the Hitchiti Experimental Forest Manager to further discuss this project.

1.6 ISSUES AND SCOPE OF THE EA

Issues can be defined as the relationship between the Proposed Action or its alternatives and the human and natural environment. Issues were identified by the Forest, State and Federal agencies, a review of similar projects, and by the public during the scoping process.

Issues are used to define and focus the discussion of the affected environment for each resource area and the analysis of the potential environmental consequences of an action. Issues were separated into two groups: key (or major) and non-key. Key issues are defined as those directly or indirectly caused by implementing the Proposed Action or its alternatives. Non-key issues are identified as those outside the scope of this EA; already decided by law, regulation, the Forest Plan, or other higher-level decision; irrelevant to the decision to be made; or conjectural and not

supported by scientific or factual evidence. In addition, resource areas that would remain unaffected by any of the alternatives are considered non-key issues.

A summary of issues and resource areas analyzed in this EA is presented in Section 1.6.1 below. Those issues and resource areas that were dismissed from further analysis are discussed in the project file, along with the rationale for their dismissal.

1.6.1 Key or Major Issues

The following two key issues are analyzed in this EA:

Water Quality (Key Issue #1)

Protection of water quality is required by the Federal Clean Water Act (CWA), as well as Georgia water quality regulations. Timber management activities could affect water quality, and subsequently, aquatic species, by exposing soils, leading to increased erosion during storm events and subsequent higher suspended solid loads and turbidity in downstream surface waters. The streams which could be potentially affected by activities in the project area include Caney Creek, Hurricane Creek, and several smaller intermittent streams. In addition, water quality could be degraded by the use of herbicides. Activities within riparian areas and wetlands have the potential to degrade water quality. Therefore, impacts to water quality are analyzed in this EA.

Vegetation and Wildlife, Including Proposed, Endangered, Threatened, and Sensitive (PETS) Species (Key Issue #2)

Given the purpose and need of the project – to restore habitat for the RCW, a Federally listed endangered animal species, both vegetation and wildlife, including PETS species, would be affected by the project. Thinning activities have the potential to disturb wildlife and alter habitat and prescribed burning may result in similar effects. The canebrake restoration activities have the potential to increase snags which may modify habitat for some wildlife species. In addition, the placement of artificial cavities and nesting structures also has the potential to modify habitat for wildlife species such as RCW and squirrels. This is also an issue because of the need to make a best effort to comply with the Recovery Plan and RCW EIS.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section describes and compares the alternatives considered for the RCW habitat and canebrake restoration project. Two alternatives are examined in detail in this EA, and are described in Sections 2.1 and 2.2. In addition, one alternative was considered, but eliminated from further study. This alternative is described in Section 2.3, which also provides the rationale for its elimination. Section 2.4 lists mitigation measures, which would be implemented as part of the action to be taken. Section 2.5 presents the alternatives considered in comparative form, defining the differences in impacts resulting from each alternative.

Note on Reported Acreages – For the purposes of this assessment, all acreages for specific treatments, landscape analyses, etc. are calculated using GIS (Geographic Information System) based data sources. GIS based calculations of acreage and distances are made from an aerial perspective, and do not take into account topographic effects on area and length measurements. As a result, reported acreages in this document are considered to be approximate, and may vary slightly from acreages determined by ground-based methods.

2.1 ALTERNATIVE 1: NO ACTION (CURRENT MANAGEMENT)

Consideration of the No Action alternative is required by NEPA and CEQ regulations for implementing NEPA. Existing habitat is not suitable for the RCW within the project area on the Oconee National Forest. A majority of the pine stands within the project area have excessive amounts of pine stems beyond the preferred habitat requirements (see Revised RCW Recovery Plan). Desired habitat is between 40 and 70 basal area (BA), while current stand information within the project area shows basal areas over 90. Thus, at present, stands do not provide the open park-like stands that the RCW needs for suitable habitat. In addition, the RCW cluster sites and foraging habitat have suffered attacks by southern pine beetle due to the dense vegetation (Goal/Objective 8D/05, hazard reduction). Under Alternative 1, no vegetative thinning nor canebrake restoration would occur within the project area, and current management of Compartments 7, 9 and 10 would continue. Current management includes periodic prescribed burning, some level of noxious weed control (privet control), cut and leave in SPB spots, regular road maintenance, and other activities covered in approved NEPA decision documents. There would continue to be some efforts made for the protection and enhancement of the RCW, including monitoring, placement of inserts, and removal of predators and nest cavity competitors; however, no direct efforts to improve the quality and quantity of RCW foraging and nesting habitat would be made. This alternative would not meet the requirements of the ESA (ESA, 1973). In addition, other resource-related activities, including canebrake restoration and aggressive noxious weed treatment, would not occur under this alternative. The No Action

alternative serves as a basis for comparison of the environmental impacts of the Proposed Action and its alternatives, and is a viable alternative.

2.2 ALTERNATIVE 2: RCW HABITAT AND CANEBRAKE RESTORATION (PROPOSED ACTION)

This alternative primarily consists of using vegetation manipulation by thinning and midstory control (via mechanical methods, herbicide use and prescribed fire) to help restore habitat for the RCW within Compartments 7, 9 and 10. These compartments were chosen for this project as the district has been working eastward at implementing projects to create a more contiguous block of suitable RCW habitat. Field implementation began in 2004 in compartments 1 and 2 along the western edge of the Hitchiti Experimental Forest, and with current projects going on in compartments 5, 6, and 8, the natural progression was to proceed east into compartments 7, 9, and 10. Additionally, areas along Caney Creek and a small drainage in Compartment 7 would be treated to restore canebrake.

Alternative 2 is based on the need for RCWs to have open areas of mature pines 60 years and older for nesting. Foraging habitats vary in age but usually are pine savannas with little, if any, midstory of hardwood (USFWS, 2003a). Desired habitat is between 40 and 70 basal area (BA), while current stand information within the project area shows basal areas over 90. Thus, at present, stands do not provide the open park-like conditions that the RCW needs for suitable habitat. The proposed thinning regime would create open stands of mature pines with little or no understory, maintained by the use of prescribed fire.

Specific activities that would occur under Alternative 2 are listed and described below. Maps of project activities, by compartment, under Alternative 2 are provided in Appendix F of this EA.

- Thin approximately 768 acres in Compartments 7, 9 and 10 to reduce stands to a 60 square-foot basal area (BA). Of the total acres to be thinned, the majority (514 acres) is mature pine saw timber, with smaller portions of immature pine saw timber (254 acres). **Table 2.2-1** shows a breakdown of the approximate number of acres proposed for thinning in each compartment. All vegetation management activities would be implemented in accordance with Forest Plan standards and *Georgia's Best Management Practices for Forestry* (GDNR et al., 1999).

Table 2.2-1. Acres Proposed for Thinning By Compartment under Alternative 2						
Comp.	**Stands**	**Total Comp. Acres***	**No. Acres to be Thinned***	**No. Acres For Each Stand Type***		
				Mature Pine Sawtimber	**Immature Pine Sawtimber**	**Pine Pole Timber/ Precommercial**
7	1, 2, 3, 4, 5, 7, 8, 51	316	279	122	57	100
9	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	504	253	120	24	109
10	1, 2, 3, 5, 7, 8, 9, 10, 12, 13	340	236	144	17	75
	TOTAL	1160	768	386	98	284
*Includes National Forest System lands only.						

- Shelterwood harvest on approximately 80 acres of lightly stocked overmature stands previously impacted by SPB in Compartment 9 (stand 16); Compartment 10 (stand 6 and 14).
- Conduct prescribed burning of approximately 1160 acres over the next several years, within recruitment stands to control midstory vegetation.
- Develop thirty 10- to 20-acre RCW recruitment sites (artificial cavity inserts and midstory control) approximately ¼ to ½-mile apart (USFWS guidelines) in Compartments 7 & 9; rehabilitate old recruitment sites in Compartment 10.
- Create 120 RCW artificial cavities/inserts (at least 4 cavities available for each RCW recruitment site) after thinning and prescribed burning, including boundary signage and tree marking.
- Construct approximately 1 mile of temporary road;
- Reopen and rehabilitate approximately 4.5 miles of temporary roads to access timber stands and utilize existing log landings within the project area where possible. These roads were used the last time timber was removed from the area (approximately 15 years ago), and reopening them would only involve minor disturbance. Understory vegetation would be cleared from the surfaces of these temporary roads, and gravel would be spread in dips, on slopes exceeding 10 percent, and at intersections with surfaced roads. **Table 2.2-2** presents a breakdown of the number of miles of existing and new temporary roads to be used in each compartment. In addition, this table presents the approximate number and acreage of landings to be used in each compartment under Alternative 2.

Table 2.2-2. Landings and Roads By Compartment under Alternative 2			
Comp.	**No. of Landings (Approx. Total Acres)**	**Miles of Existing Temp. Roads Reopened**	**Miles of New Temp. Road Construction**
7	8 (3 acres)	1.6	.3
9	17 (6 acres)	1.6	.4
10	11 (4 acres)	1.3	.3
Total	36 (13 acres)	4.5	1.0

- Reforest approximately 157 acres of SPB damaged stands scattered throughout the project area with pine seedlings (includes the 80 acres of shelterwood harvest listed previously);
- Restore 15 acres of canebrake adjacent to Caney Creek and a small drainage in Compartment 7 by reducing the overstory through girdling to a BA of 40 square feet. The girdled trees will be left standing in place.
- Control coppice sprouting and release pine regeneration using herbicides in SPB spots, to insure survival of pine seedlings.
- Gully restoration on approximately 3 acres by terracing and establishing vegetation.
- Use a combination of herbicides and mechanical methods to control unwanted vegetation on approximately 800 acres within RCW foraging and nesting areas. All hardwoods within the areas are not considered as unwanted vegetation. Hardwoods would remain within riparian areas and on sites where determined to be the best species left in place. Fruit-bearing species would not be targeted for removal and hard mast bearing species (oaks and hickories) would be favored over other hardwood species. Unwanted vegetation also includes invasive species such as privet, kudzu, and wisteria. Treatments (herbicides, mechanical, prescribed fire) needed to control unwanted vegetation would be determined upon post-harvest evaluations. Herbicides would be applied manually (foliar spray or injection); no aerial application of herbicides would occur. When implemented, foliar spray applications would be applied to unwanted vegetation less than 5 feet in height. Felling with stump treatment applications or injection applications would be used to treat unwanted vegetation over 5 feet in height. Areas with older and/or dense growth of unwanted vegetation may have selective treatments with herbicides prior to prescribed fire applications to better manage the desired control. Some of these areas may also have post prescribed fire selective treatments with herbicides. Areas where prescribed fire controls most of the unwanted vegetation would only have selective spot treatments with herbicides. Some areas may have unwanted vegetation controlled by prescribed fire and the use of herbicides may not be necessary. Herbicide applications will be done with low pressure backpack sprayers and/or cut surface treatments (stump treatment or injection). Once post-harvest herbicide treatments are implemented, periodic prescribed fire is planned for all of the areas to maintain the control of the unwanted vegetation and reduction of ground fuels. Some areas may require periodic selective spot applications with herbicides along with periodic prescribed fire for control of unwanted vegetation. Refer to Appendix E for more information on herbicides. Noxious weed control would continue annually until the eradication of the targeted species is obtained (USFS, 2002a). During mechanical treatments, hand-controlled devices (such as chain saws) primarily would be used, with some exceptions where a machine could be used to grind the midstory.

Upon completion of the proposed vegetation management activities, all of the temporary roads would be closed except for administrative use; permanent roads would continue to be maintained as permanent roads. The majority of these temporary roads would be seeded with wildlife mixtures and native grasses and allowed to revegetate. However, some would be permanently maintained as wildlife openings. In addition, roads that access a RCW insert or natural RCW tree would be seeded and maintained.

2.3 ALTERNATIVES ELIMINATED FROM FURTHER STUDY

CEQ regulations for implementing NEPA require that Federal agencies explore and objectively evaluate all reasonable alternatives to the Proposed Action, and to briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This section describes alternatives to the Proposed Action that were considered and eliminated from further study. The rationale for elimination is also given.

Improve Nesting Opportunities without Vegetation Management

An alternative of improving RCW nesting opportunities by drilling nest holes and placing inserts in the project area, but not conducting vegetation management activities (i.e., thinning), was considered. Under this alternative, although nesting opportunities would be increased, the future planned translocation of RCW would not occur. This alternative was dismissed from further consideration because it does not meet the purpose and need (as stated in Section 1.3 of this EA) of establishing overall favorable habitat for the RCW on the Forest and complying with the provisions of the ESA, the EIS and ROD for the *Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region,* the revised *Recovery Plan for the Red-cockaded Woodpecker*, and the direction established in the Revised Forest Plan. Without habitat management and restoration, the RCW would not migrate into the project area regardless of whether additional nesting opportunities were provided, and the RCW recovery objectives would not be met on the Oconee National Forest (Piedmont Recovery Unit). Therefore, this alternative was dismissed from further consideration.

2.4 MITIGATION MEASURES

During vegetation management activities, standard best management practices (BMPs) and Forest-wide standards and guidelines would be implemented as provided in the amended Forest Plan and *Georgia's Best Management Practices for Forestry*. Implementation of these BMPs would control or reduce potential adverse impacts from soil erosion, surface water runoff, and sedimentation. In addition to these, other measures would minimize or avoid adverse impacts to environmental resources during the proposed activities. **Table 2.4-1** lists these other measures according to the resource area affected. Appendix C also lists standard mitigation measures for prescribed burning that would be implemented under the action alternatives.

Table 2.4-1. Recommended Mitigation Measures By Resource Area

Resource Area	Mitigation Measure
Water Quality and Aquatic Species	• The USFS would stipulate that the contractor avoid use of heavy equipment when soils are wet, such as after a storm event. If work on saturated soils is not preventable, the USFS would require the contractor to use low ground pressure equipment, logging mats, or other techniques.

	• Planning and approval of log landing and skid trail locations would ensure that they are located in stable, well-drained areas, away from gullies. Skidding and decking would be limited to designated and approved routes along ridgetops and gentle side slopes to protect sensitive soils (i.e., wet and micaceous soils). • The USFS would require the contractor to conduct all timber harvest and roadwork activities in accordance with *Georgia's Best Management Practices for Forestry* and Forest Plan standards and guidelines. • Compacted soils on skid trails, temporary roads, and log landings would be tilled before seeding to increase water infiltration. • Drainage structures at existing stream crossings would be assessed to determine if maintenance, repair, or replacement is required to accommodate stream discharge and fish passage, and to protect water resources. • If wetlands within the project area are field-verified, thinning operations within the wetland boundaries would be minimized and performed to ensure that the function of the wetland is preserved.
Vegetation and Wildlife, Including PETS Species	• Log landing and skid trail locations would be reviewed and approved by the USFS prior to harvest to ensure they are appropriately planned to minimize soil impacts and damage to residual trees. • Compacted soils on skid trails, temporary roads, and log landings would be tilled before seeding to enhance revegetation. • No mechanical or herbicide treatment will be allowed during the RCW nesting season of April 4th through July 6th each year. • Certain log landings used for the project would be left open and maintained as wildlife openings over the long-term. These would include landings in: o Compartment 7 o Compartment 9 o Compartment 10 Fruit trees would be planted along the edges of the above wildlife openings to provide browse and cover for birds, deer, and other small mammals.

2.5 COMPARISON OF ALTERNATIVES

Table 2.5-1 compares the potential environmental impacts resulting from the Proposed Action and its alternatives. Potential impacts are grouped according to key issue. Section 3.0 of this EA contains a detailed discussion of these potential impacts by key issue.

Key Issue	Measurements	Alternative 1: No Action (Current Management)	Alternative 2: RCW Habitat Restoration (Proposed Action)
Water Quality	Number of new road-stream crossings	0	0
	Miles of temporary road constructed and reconstructed/ reopened (and miles within riparian corridor)	0	1 mile new construction; ~4.5 miles reopened (0 miles within riparian corridor)
	Number of log landings developed (and number within riparian corridor)	0	36 log landings (0 within riparian corridor)

	Acreage of treatment stands within riparian corridor of perennial and intermittent streams and wetlands	0	110 acres within riparian corridor
Vegetation and Wildlife, Including PETS Species	Changes in available habitat for management indicator species (MIS) and general wildlife in the project area	General: --Continued loss of vegetation diversity and abundance in forest understory (decrease browse). --Long-term increase in mature, continuous canopy forest habitat and wildlife species. --No promotion of early successional habitat. MIS: --Beneficial effect on pileated woodpecker and wood thrush and their habitats. --No noticeable effect on Acadian flycatcher, hooded warbler, field sparrow, prairie warbler, scarlet tanager, Swainson's warbler, and white-tailed deer or their habitats. --Adverse effect on pine warbler and RCW and their habitats.	General: --Increase in understory plant diversity and abundance (increased browse). --Increase in early successional habitat. --Increase in habitat diversity from a combination of thinning and prescribed burning. MIS: --Beneficial effect on prairie warbler, pine warbler, RCW, and white-tailed deer and their habitats. --No noticeable effect on Acadian flycatcher, pileated woodpecker, hooded warbler, field sparrow or scarlet tanager or their habitats. Slight beneficial impact to Swainson's warbler and its habitat through canebrake restoration. --Adverse effect (minor) on wood thrush habitat.
	Changes in forest health (changes in general forest conditions, SPB incidences, and noxious weeds)	--Tree growth and forest health would decline over time, and would stabilize at a lower level. --Increased potential for SPB attacks. --Noxious weeds would continue to take over portions of the project area, and would likely spread to adjacent areas.	--Tree growth and forest health would improve. --Decreased potential for SPB outbreaks to occur. --Decrease in spread of noxious weeds, benefiting natural vegetation.
	Effects on the RCW and available habitat for the species	--No promotion or creation of RCW habitat. --Alternative would not work toward recovery plan objectives or be in compliance with the Endangered Species Act.	--Long-term, beneficial impact on RCW populations and habitat. --About 1,160 acres of habitat would be improved for the RCW. --Alternative is in compliance with recovery plan objectives and with the ESA.
	Effects on other PETS	No effects on any other PETS species.	No effects on any other PETS species.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section has been organized according to environmental components, or resource areas. Each resource section contains information on the affected environment (existing conditions), direct and indirect environmental consequences of each alternative, and cumulative impacts.

The interdisciplinary study team (see Section 6.0, List of Preparers) first identified the specific activities, tasks, and subtasks involved in the Proposed Action and its alternatives. The full range of direct and indirect effects that could potentially occur as a result of the Proposed Action and its alternatives were then identified and analyzed, as if all applicable Forest Plan mitigation measures are in place and being effective. Direct effects are impacts caused by the alternative(s) at the same time and in the same location as the action. Indirect effects are impacts caused by the alternative(s) that occur later in time or farther in distance than the action.

A cumulative impact is an impact on the natural or human environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency, organization, or person undertakes such other actions. Cumulative impacts can result from individually minor and insignificant, but collectively significant actions, taking place over a period of time. Cumulative impacts were assessed by combining the potential environmental impacts of the alternatives with the potential impacts of known projects that have occurred in the past, are currently occurring, or are projected to occur in the future within the region of the Proposed Action. Known past, current, and reasonably foreseeable future projects in the vicinity of the project area are described below.

Historically, the land area managed by the USFS on the Oconee National Forest was primarily deciduous hardwood forest. Much of the land was subjected to severe erosion during the 1800s and early 1900s due to a lack of conservation practices during intensive agricultural use. This land was extensively cleared and farmed, and underwent cycles of land abandonment and re-clearing. As a result, millions of tons of soil were washed into the streams in the area, destroying water-related species. When the Federal government obtained the land in the 1930s, conservation practices, such as tree planting (pines), gully removal, soil restorations, gabion installation, and reintroduction of aquatic species, were implemented on the land. These conservation practices continue to occur, reducing additional sediment loads into streams. Currently, 72 percent of the Oconee National Forest is primarily covered in loblolly pine with some mixed hardwood (USFS, 2001; 2003c).

Forest cover and forest health on the Oconee National Forest have been and remain high concerns due to tree declines, non-native diseases, insect pests, and non-native plants. The SPB, a native insect, has been a recurrent challenge on an approximate 3- to 5-year cycle on the Forest. The most recent epidemic began in 1999 and continued through about 2002. This epidemic has resulted in severe pine tree mortality, and is threatening the RCW Sub-HMA (the proposed project area). In response to this epidemic, the USFS implemented cut-and-leave and

salvage treatment programs on the Oconee National Forest (USFS, 2001). Cut-and-leave suppression was conducted on various SPB spots during 2000. Most spots were less than 1 acre to a few acres in size. Many of those spots are located near these RCW cluster sites, and threatening cluster sites near the Piedmont National Wildlife Refuge. The intensity of the SPB is currently becoming evident in these areas. An outbreak of some degree could occur within the damaged spots that were not treated in 2003. The majority of infested trees was pole-sized pine forest (diameters between 9 and 12 inches) under 40 years of age, which has not had a first thinning, but still provided foraging habitat. However, some trees (diameters greater than 12 inches) over 60 years old (which are suitable foraging and potential nest trees for RCW) have also been infested with SPB. These SPB infested areas are within or near cluster sites that are active, inactive, or may provide future recruitment sites (Caldwell, 2006).

3.1 PHYSICAL ENVIRONMENT

3.1.1 Water Quality

Element: The Proposed Action and its alternatives may adversely affect water quality through increases in erosion, sedimentation, and nutrients to streams, as well as changes in riparian habitats.

Measurements:

- Number of new road-stream crossings
- Miles of temporary road constructed and reconstructed (and miles within riparian corridor)
- Number of log landings developed (and number within riparian corridor)
- Stands within riparian corridor of perennial and intermittent streams and wetlands

Bounds for Analysis:

- Spatial: The area potentially affected by the proposed activities includes project area streams, riparian areas, and wetlands within the 6th level HUC. Stream effects could occur from locations within the project area to a short distance downstream of the project area.
- Temporal: Temporary effects include those effects lasting only during the actual treatments/activities. Short-term effects include those effects lasting up to a few years following cessation of activities. Long-term effects would be those effects that would last more than a few years, or those that would be permanent.

3.1.1.1 Affected Environment

3.1.1.2 Environmental Consequences

Historic land use practices of the 1700s and 1800s contributed to the origins of the Oconee National Forest in the Georgia Piedmont. Gentle topography combined with deep, fertile soils and favorable climate created ideal conditions for intensive agriculture production in the Southern Appalachian Piedmont. Upland soils were continuously cleared and cultivated for the production of cotton until perceived as exhausted and then abandoned. Conservation practices were not a component of agriculture in this time period and the abandoned land suffered accelerated erosion that delivered tons of sediment to the region's streams and rivers. These conditions continued until the 1930s when the Federal government began acquisition of tracts of worn out agricultural lands and began to restore productivity through the use of conservation practices.

Restoring vegetation cover to the uplands in the 1930s resulted in drainage controls and a slow recovery of streams. Sediment delivered to the streams for many years began to stabilize and streams began to regain conditions suitable for aquatic communities. The conservation practices that help stabilize watershed conditions continue in current watershed management projects on the Oconee National Forest. Maintaining and rebuilding soil productivity has been an emphasis of the Forest Service on the Oconee lands since its inception. Georgia's Best Management Practices for Forestry (1999) identifies a number of measures, along with Forest Plan standards, to follow to continue the restoration of soil productivity and healthy watersheds.

All streams within the boundaries of the Oconee are classified as warm-water, with fishing as the State designated beneficial use in Georgia's Water Quality Control regulations. The proposed project areas (Compartments 7, 9 and 10) are located within watersheds drained by the Ocmulgee River, identified as a fifth level hydrologic unit (HUC) and watershed management area (WMA) in the 2004 Forest Plan, named the Ocmulgee River-Rum Creek WMA. Total land area in the WMA is 137,600 acres, with National Forest land making up thirteen (13) percent. The project area comprises 1160 acres or 0.8% of this 5th level HUC (#0307010313). The Piedmont National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service, is also situated in the Ocmulgee River-Rum Creek WMA.

Streams draining proposed projects in Compartments 7, 9 and 10 include Caney Creek and Hurricane Creek, both of which are tributaries to Falling Creek downstream. The individual proposed projects occur in a 6th level HUC (#030701031305), a sub unit of the larger 5th level HUC described previously. Total acreage in the 6th level HUC totals 22,591 with vegetation management activities proposed on 850 acres or 3.7% of the HUC.

Sediment in streams is a natural feature, however human actions, such as road construction and use, forestry, agriculture and recreation can accelerate erosion and result in additional sediment. Measures to control this erosion include the use of best management practices during activities and scheduling treatments to minimize impacts to streams. The streams within the project area are regaining healthy conditions suitable to support aquatic organisms such as fish and invertebrates. Additional measures are included in timber sale contracts to control the acres disturbed (no more than two units open with active harvesting at any one time). Harvesting contracts typically have a three year period to spread out any site disturbance over time rather

than concentrating the impacts in an area. At most no more than 0.6% of the 6th level HUC would have active timber harvest activities on National Forest lands at any given time.

Wetlands

A 4.7 acre wetland along a tributary of Caney Creek is identified in the National Wetland Inventory (USFWS). This area is classified as a freshwater forested/shrub wetland. No management activities are proposed for this area.

Alternative 1 (No Action: Current Management)

Under Alternative 1, none of the proposed vegetation management or other activities would occur. No additional adverse impacts on water resources would be anticipated under this alternative. Current management includes periodic prescribed burning, some level of noxious weed control (privet control), cut and leave in SPB spots, regular road maintenance, and other activities covered in approved NEPA decision documents. There would continue to be some efforts made for the protection and enhancement of the RCW, including monitoring, placement of inserts, and removal of predators and nest cavity competitors; however, no direct efforts to improve the quality and quantity of RCW foraging and nesting habitat would be made.

Alternative 2 (Proposed Action: RCW Habitat and Canebrake Restoration)

Harvest and Midstory Control

The Oconee National Forest proposes to thin 768 acres and shelterwood harvest 80 acres of loblolly pine in Compartments 7, 9 and 10. Harvest activities would include tree removal, use of heavy equipment, reconstruction/use of log landings and skid trails, and road maintenance, reconstruction, and construction. Reforestation activities would occur on approximately 131 acres. In addition, midstory control would occur on approximately 850 acres by mechanical and chemical treatments. All of these activities cause soil disturbance, exposure, erosion, and compaction, which can degrade water resources by increasing water and pollutant runoff to streams.

Removal of vegetation through harvest, mechanical treatments and herbicide use can degrade stream water quality by increasing sediment and nutrient runoff input to streams. Removal of vegetation can also affect the quantity of surface water runoff. Vegetation provides erosion control through water infiltration and uptake, reducing runoff to streams, and through soil stabilization. Hood et al. 2002 found no significant difference in erosion after a thinning down to 60 ft^2/ac compared to a no harvest area. To put the sediment movement into perspective, on average in the U.S., 4.37 tons/ac/yr of sediment is eroded from cropland versus 0.91 tons/ac/yr from forestland. Studies have shown that erosion from harvested forests returns to pre-harvest levels by 2 years after harvest (Hood et al., 2002).

Nutrients, including nitrogen and phosphorus, can enter waterbodies attached to sediment, dissolved in water runoff, or through the air (USEPA, 2001). Nutrient losses tend to increase

proportionately with sediment losses (Schultz, 1997). Increased nutrient runoff to streams can have either adverse effects (Lemly, 2000) or potentially beneficial effects, depending on the level of nutrient runoff, and the current nutrient content of the streams (Tank and Webster, 1998). Many aquatic systems are nutrient poor, and therefore, small increases in nutrients can improve their productivity (USFS, 1989a).

Of particular concern are treatment areas encroaching on riparian areas and wetlands, where removal of vegetation can have the greatest impact. In accordance with the revised Forest Plan (2004), riparian corridors have been established on the Oconee National Forest, within which management practices are designed to maintain riparian functions and values. Riparian corridor widths for the Oconee National Forest are presented in **Table 3.1-1**.

Table 3.1-1. Riparian Corridor Widths By Slope Class and Stream Type for the Oconee National Forest

Slope Class	Minimum Width (feet) of Corridor on Each Side	
	Perennial Streams and Wetlands	Intermittent Streams
0 – 30%	100	50
31 - 45%	125	75
45%+	150	100

Source: USFS, 2004a

Implementation of forested riparian areas provide a buffer to streams and wetlands, protecting water quality by retaining and filtering pollutants in runoff before the runoff reaches the stream channel or wetland. Within the project area, the majority of the riparian areas and wetlands are forested, and all have slopes between 0 and 30 percent.

Using the above riparian corridor widths, the study team identified the number of stands proposed for harvest under Alternative 2 containing areas that are within 100 feet of a perennial stream or wetland or within 50 feet of an intermittent stream. **Table 3.1-2** lists these stands, by compartment, as well as the acreage of these stands in riparian corridors.

Table 3.1-2. Stands Proposed for Thinning within Riparian Corridors under Alternative 2

Comp.	Stands with Portions in Riparian Corridors	Approx. Acres in Riparian Corridor by Compartment
7	1, 2, 3, 4, 5, 7	40
9	4	36
10	1, 2, 3, 5, 6, 7, 8, 9, 10, 13, 14	34
Approx. Total Acreage within Riparian Corridors		110 acres

Adverse impacts on water resources from potential increases in water runoff, sediment, and nutrient yields as a result of the proposed vegetation management activities would be minimized through implementation of *Georgia's Best Management Practices (BMPs) for Forestry* (GDNR et al., 1999) and Forest Plan standards and guidelines, which require measures/activity restrictions to be taken to minimize impacts within riparian corridors for the protection of water quality. In accordance with these guidelines, timber harvesting techniques that minimize soil disturbance, such as backing trees out with a machine and using low ground pressure equipment, logging mats, and equipment with booms or cable winches, would be used within riparian corridors. All streambank vegetation would be left uncut, and groundcover within the riparian corridors would be retained. Within the riparian corridor along perennial streams, Georgia BMPs require an average of 50 square feet of BA per acre to be left evenly distributed (or at least 50 percent canopy cover) after a harvest. Within the corridor along intermittent streams, an average of 25 square feet of BA per acre (or at least 25 percent of the canopy cover) must be left evenly distributed. Within 25 feet on either side of ephemeral streams, a minimum of 20 square feet per acre of basal area of canopy or midstory trees are required to be left in place following timber harvest activities. In addition, no handling, mixing, or storing of toxic or hazardous materials (fuels, lubricants, pesticides, fertilizers) is permitted within the riparian corridors (GDNR et al., 1999).

Although some of the proposed harvest and midstory control operations may occur within riparian zones in the project area, any harvesting within these areas would be performed in a manner that ensures the continued function of the riparian zone. Implementation of the above guidelines during timber harvest would reduce increases in surface water runoff entering streams as a result of vegetation removal and soil compaction, thereby reducing impacts on stream flow and channel erosion; avoid or greatly minimize any impacts on water temperature through prohibition of tree removal near streams and other water bodies; reduce channel erosion by increasing stream bank stability; and reduce the amount of nutrients and sediment entering streams, thereby protecting water quality. No wetland areas (as identified by the NWI) are found within areas proposed for thinning treatments. If wetlands are found, thinning operations within the wetland boundaries would be minimized to ensure that the function of the wetland is preserved.

Overall, surface water runoff, erosion, and sedimentation impacts from vegetation removal through thinning and midstory control would be short-term, lasting only until understory vegetation in thinned areas begins to grow. Thinning would allow more sunlight to reach the forest floor, which would encourage and increase the amount and growth rate of understory plants. This understory vegetation would increase rainfall infiltration, reducing surface water runoff and soil erosion in the area, and thus reducing adverse impacts on water quality.

Road Rehabilitation/Construction and Maintenance (including Log Landings/Skid Trails)

Some temporary road construction and reconstruction/ reopening would be necessary for conducting the proposed thinning activities under Alternative 2. Approximately 1 mile of new temporary roads would be constructed, and approximately 4.5 miles of temporary roads would be reopened under Alternative 2 to conduct the proposed thinning activities. The mileage

breakdown for each compartment is provided in **Table 2.2-2** in Section 2.2 of this EA. The existing temporary roads to be reopened were last used approximately 15 years ago; reopening the roads would involve removing vegetation from the road surface and graveling the surface in areas of dips with greater than 10 percent slopes and at intersections with surfaced roads. Reopening these roads would involve minor ground disturbance, including compaction from heavy vehicle use, and vegetation removal for a 12- to 15-foot wide clearing. Road erosion is normally greatest during and immediately following the construction phase, after which soil erosion and sedimentation effects decrease exponentially (Grace et al., 1997). Where possible, approximately 36 of the existing log landings would be utilized within the project area for timber harvesting.

Road construction, reconstruction, and use can adversely affect water quality through removal of vegetation and litter cover, which act to stabilize soils, decrease surface water runoff and trap sediment and nutrients; compaction, exposure, and disturbance of soils, leading to erosion and sedimentation to streams; and increased chemical contamination as a result of spills. Road construction, reconstruction, and use are reported to be the primary source of erosion and sediment resulting from timber harvest activities (England, 1987; Fulton and West, 2002; Seehorn, 1987; Gucinski et al., 2001; Williams et al., 1999). As much as 90 percent of sediment entering streams resulting from timber harvest can be linked to the roads, log landings, and other components of the transportation system (Seehorn, 1987). Sedimentation impacts from temporary road construction and use for timber harvest activities are typically short-lived, occurring at the highest levels during and for a few years after road construction or reopening. Impacts decrease in intensity as the road surface and cut-fill slopes stabilize, and roads begin to revegetate (Fulton and West, 2002; Gucinski et al., 2001).

Road construction can also affect the hydrology of the area, resulting in changes in water yields and stream morphology. These changes in hydrology affect the amount of time required for rainfall to enter stream channels, thereby altering the timing of peak flows, and can cause changes in stream channel morphology (Gucinski et al., 2001; Miller, 1987). Temporary roads and log landings would be placed along the ridge crest, generally 300 – 500 feet or more from stream channels. In addition, all existing log landings are located outside these riparian corridors. From the log landings, the skidding pattern would fan out and decrease in intensity relative to the distance from the landing with minimal use occurring close to the riparian corridors. With this type of skidding pattern, runoff would be dissipated and filtered by forest floor litter before reaching a stream channel rather than becoming concentrated.

The majority of adverse impacts on water resources and water quality resulting from the road system and associated log landings are directly related to the length/size, placement, and conditions of the roads and landings. Road and log landing construction adjacent to stream channels poses the highest risk for adverse impacts. Under Alternative 2, no new road-stream crossings would be constructed and all temporary roads proposed for construction or reopening/ reconstruction would be located outside of the riparian corridors presented in **Table 3.1-1** above. Effects on water resources from potential increases in water runoff, sediment, and nutrient yields from roadwork under Alternative 2 would be minimized with the use of mitigation measures designed to reduce erosion and sediment. The use of and adherence to *Georgia's BMPs for*

Forestry (GDNR et al., 1999) and Forest Plan standards and guidelines would ensure compliance with the Clean Water Act.

For temporary roads and log landings, increased erosion would be primarily limited to the period of use of the roads and landings, as erosion levels would rapidly decline to baseline levels following the closure and reseeding of temporary roads and landings. Upon completion of thinning activities, skid trails, log landings, and temporary roads would be closed by water bars and seeded with native grasses to stabilize and rehabilitate exposed soils. Compacted soils on skid trails and log landings would be tilled before seeding to increase water infiltration. Groundcover vegetation should regenerate rapidly from greater light penetration to the forest floor, stabilizing soils and reducing erosion and water runoff. In addition, all retired access roads would be inspected periodically by the USFS to assure effective stabilization. Therefore, temporary roads, log landings, and skid trails would not contribute to sedimentation over the long-term.

Of the existing 36 log landings proposed for use under Alternative 2, 12 would be maintained permanently as wildlife openings. These openings would not contribute to sedimentation to streams over the long-term, since native grasses and shrubs would be established and maintained in each opening, providing adequate runoff control over the long-term.

Canebrake Restoration

Opportunities along Caney Creek to restore canebrake are proposed in Alternative 2. Successful restoration of canebrake normally requires existing canebrake and the removal of overstory trees that are blocking the sunlight. Five areas along Caney Creek and along a small stream in Compartment 7 stand 9 have been identified as restoration sites. In these five areas a portion of the overstory trees will be killed by girdling in Alternative 2 to allow for the expansion of the canebrake. This activity will take place in the riparian zone along the creek within 100 feet of the creek, and, in places up to 200 feet from the creek. There will not be any earth disturbing activity that would cause sedimentation. Machinery will not be needed in this action. Treated trees will be left standing to further decrease the possibility of soil disturbance. It is possible that herbicides could accidentally enter Caney Creek and affect water quality. The herbicides applied to kill the overstory trees will be directly injected to the tree. Spray or broadcast application will not be used which limits the possibility of herbicides entering the stream. Only herbicides labeled for use near water will be used. These actions should minimize the possibility of polluting Caney Creek. The restoration of canebrake will also create snag habitat, potentially leading to increased wildlife diversity in the area. Figure 3.3-1displays the locations of the restoration work along Caney Creek for Alternative 2.

Gully Restoration

Opportunities to stabilize several gullies are proposed in Alternative 2. A successful gully restoration involves terracing the banks of a gully and then establishing vegetation along the new terraces. While the actual process of terracing involves movement of soil and thus the potential for sediment movement, the exposed soil will be revegetated to hinder any future sedimentation

movement which would likely occur if no action was taken. The establishment of vegetation in the gully should prevent further expansion of the gully which could occur if no action was taken.

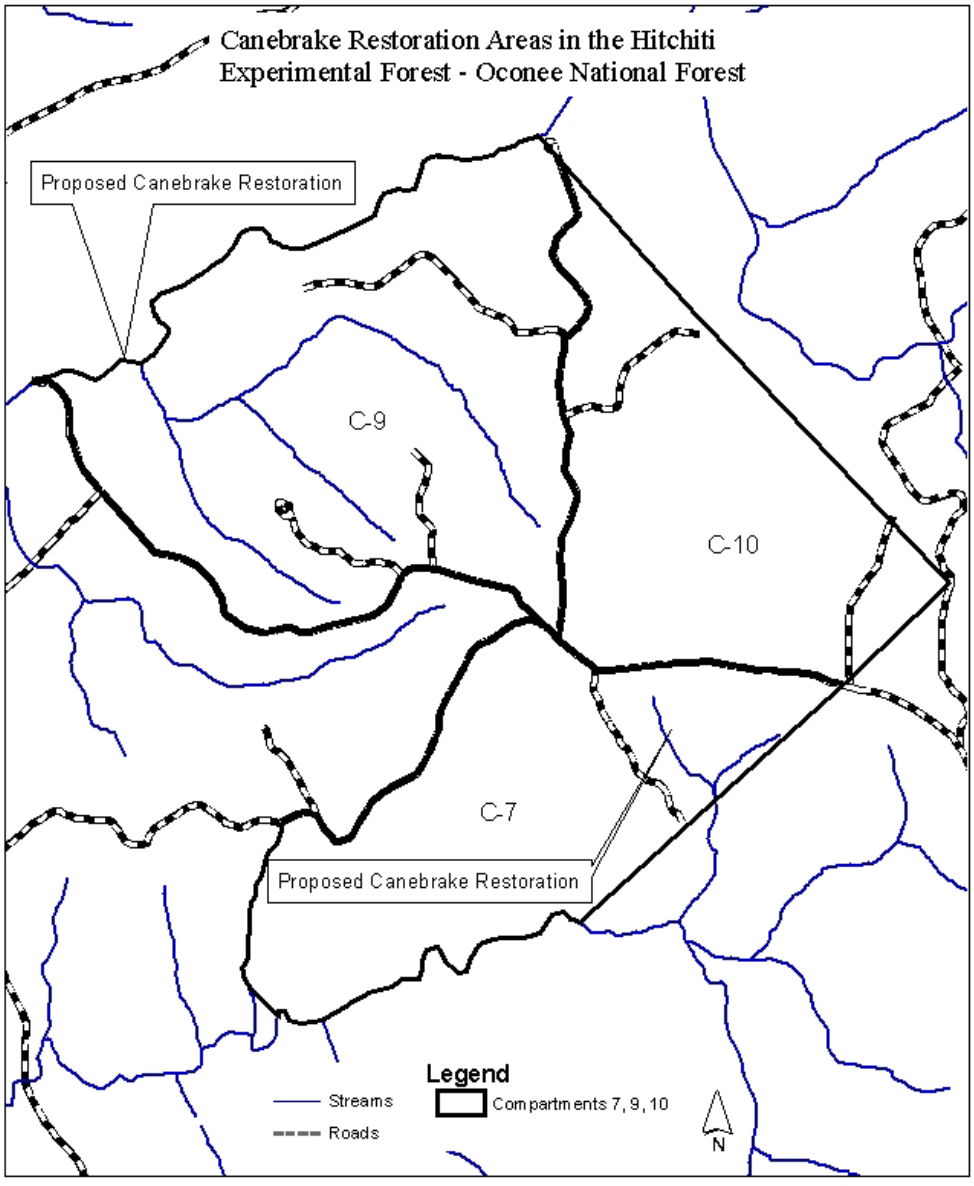

Figure 3.3-1 Canebrake Restoration Areas

3.1.1.3 Cumulative Impacts

Although Alternative 1 would not result in any direct, adverse impacts on water resources or aquatic species, the beneficial effects from gully restoration and road maintenance activities would not occur under this alternative. This alternative would not work toward improving water quality or aquatic habitat on the Forest. However, since other Forest activities are aimed at erosion and sediment control and improving degraded water quality, Alternative 1 would not contribute to significant, adverse, cumulative impacts on water quality.

Although some SPB suppression activities have been conducted on National Forest lands within the project area within the past few years, little timber harvesting has occurred on these lands over the last decade or so. However, prescribed fire has been conducted on lands in the project area. Prescribed fire can lead to short-term increases in soil erosion, runoff, and sedimentation due to a loss of understory vegetation, which can adversely affect water quality and aquatic species. Cumulative impacts on water quality from prescribed burning, however, are considered minimal, as understory vegetation quickly reestablishes in burned areas to stabilize soils and reduce sediment (USDA, 1989a).

Since 1991, the USFS has invested substantial time, money, and resources to aid in the recovery of the RCW within the Habitat and Sub-HMA on the Oconee National Forest. In fiscal year 2003, the Oconee Ranger District issued a Decision Memo regarding the use of prescribed burning within the HMAs and Sub-HMAs and Greene County to improve RCW habitat and other wildlife habitat. This decision involved burning approximately 18,300 acres over the next 2 years in these areas (USFS, 2003a).

Impacts on water quality from timber harvests are normally recovered before a new cycle of harvesting begins, and as a result, cumulative impacts from successive harvesting operations would be expected to be minimal for the majority of harvested areas. In those areas that produce a significant amount of grasses and legumes following harvest operations, increased water infiltration and reduced runoff and sedimentation would be anticipated. Resultant soil stabilization can provide long-term benefits to water resources. Areas that are repeatedly used for logging decks and skid trails in stands that have frequent entries have the potential to suffer more continuous periods of increased water runoff, and subsequent erosion and sedimentation impacts. Rehabilitation of these sites decreases the duration of these adverse water quality impacts and lessens the potential for cumulative degradation of water resources. Rehabilitation of a gully would have a similar cumulative response of reducing the degradation of water resources by reducing future sediment movement.

Agricultural and timber harvest activities on private lands are expected to contribute to both short-term and long-term adverse impacts on water quality and would interact cumulatively with the proposed activities under Alternatives 2. All timber harvest activities, whether on private or government lands are subject to Georgia's Best Management Practices, which are guidelines but

do carry fines if violation leads to negative impacts on water quality. Two main laws are tied to the Federal Clean Water Act (Section 404 40 CFR Part 232.3), including BMP's and the Georgia Water Quality Control Act (O.C.G.A. 12-5-29). The Piedmont Wildlife Refuge, which is a part of the watershed, regularly conducts prescribed burning and is planning to conduct 100 acres of pre-commercial thinning within the next 10 years. On Forest Service land within the watershed, 140 acres of thinning was completed in 2005 and 850 acres are under contract to be thinned before 2010. The proposed activities under Alternative 2 would be completed between 2009 and 2012. It is foreseeable that harvesting activities could take place on an additional 709 acres of Forest Service land within this watershed in the next 10 years. However, overall cumulative impacts from these activities on private lands are expected to be minimal, since the majority of the project area is forested and would remain in forested land use, which contributes comparatively little sediment relative to private non-forested uses. As these activities are spaced out over time, and on a relatively small percentage of the land area within the watershed, any cumulative impact would be minimal as erosion levels return to preharvest levels within 1 year of a harvesting activity.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Vegetation and Wildlife, Including Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Element: The Proposed Action and its alternatives could change vegetative composition and structure within the project area, subsequently affecting the availability of habitat for wildlife species, including the RCW, other PETS species, and management indicator species (MIS) within the project area.

Measurements:

- Changes in available habitat for MIS and general wildlife within the project area
- Changes in forest health (changes in general forest conditions, SPB incidences, and noxious weeds)
- Effects on the RCW and available habitat for the species
- Effects on other PETS species

Bounds for Analysis:

- Spatial: The area potentially affected by the proposed activities includes habitat within and immediately adjacent to the project area. Effects could occur from stands within the project area to a short distance around, but outside of, the project area.
- Temporal: Temporary effects include those effects lasting only during the actual treatments/activities. Short-term effects include those effects lasting up to a few years following cessation of activities. Long-term effects would be those effects that would last more than a few years, or those that would be permanent.

3.2.1.1 Affected Environment

Biological diversity (biodiversity) refers to the variety of life in an area, including the variety of genes, species, communities, ecosystems, and processes through which individual organisms interact with one another in their environment. Although the different aspects of biodiversity can be subdivided as finely as desired, the most significant parts are community diversity, species diversity, successional diversity, and interaction among elements (USFS, 2001).

The vast majority of Compartments 7, 9 and 10 are forested, with a mosaic of evergreen, deciduous, and mixed (hardwood-pine and pine-hardwood) forest communities. These compartments are primarily in evergreen forest cover with a few stands of hardwood and mixed pine-hardwood. There is limited private lands intermingled with public lands in the area. These private lands include pastures, private woodlots, industrial forested land, homes, and some small farm acreage.

Within these compartments, the project area is dominated by loblolly pine (*Pinus taeda)*, with a mixture of hardwood species, including cherry (*Prunus* spp.), dogwood (*Cornus* spp.), elm (*Ulmus* spp.), hickory (*Carya* spp.), oak (*Quercus* spp.), persimmon (*Diospyros virginiana*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), redbud (*Cercis canadensis*), and yellow poplar (*Liriodendron tulipifera*). The dominant understory species include blackberry (*Rubus* spp.), greenbriar (*Smilax rotundifolia*), Harbison's hawthorn (*Crataegus harbisonii*), honeysuckle (*Lonicera* spp.), muscadine (*Vitis rotundifolia*), and Virginia creeper (*Parthenocissus quinquefolia*) along with many other forbs and grasses (USFS, 2001).

Successional diversity refers to the plant and animal communities that inhabit or utilize habitats of different successional stages. Early successional habitats contain dense cover, high fruit and browse production, and complex ground-level structure necessary for many bird species. Late-successional stages produce abundant dens and hard mast and complex structure that improve as the forest matures. All successional stages are necessary to maintain diversity.

Of the forest stands proposed for harvest under Alternative 2, approximately 71 percent are loblolly pine sawtimber and 29 percent are loblolly pine poletimber. **Table 2.2-1** in Chapter 2 of this EA provides a breakdown of stand classes by compartment. Mature pine sawtimber includes age classes 61+ years, immature pine sawtimber includes 41 to 60 year old stands, and pole timber includes stands that are 21 to 40 years old. Habitats of other age classes, including early successional stages (0 to 20 years old), are also interspersed on private and public lands within and around the project area. This includes recently harvested areas, planted or grassed wildlife openings, and areas with young pines and hardwoods, which are approximately from 5 to 10 feet tall, interspersed with herbaceous plants, woody vines, and briars.

The majority of the forested stands within the project area currently have high basal areas and a closed canopy. However, since the late 1990s, part of the canopy has opened up throughout the Oconee National Forest as a result of SPB infestations and subsequent pine mortality. Groups of tall, infested pines varying in size from one to more than 25 acres eventually give way to an emerging deciduous and evergreen overstory (USFS, 2004b). Within the project area, the USFS

has implemented cut-and-leave and salvage programs to suppress infestations. In 2000, cut-and-leave suppression was conducted on various SPB spots within the project area. Most spots resulted in canopy openings of less than 1 acre to a few acres. In addition, the USFS has conducted prescribed burning within the project area since the early 1980s, generally burning patches within each compartment every few years to open up the understory.

Aquatic Species

Aquatic species known from the Oconee National Forest include redbreast sunfish (*Lepomis auritus*), yellow bullhead (*Ameriurus natalis*), snail bullhead (*Ameriurus burnneus*), creek chub (*Semotilus atromaculatus*), silver redhorse (*Moxostoma anisurum*), Christmas darter (*Etheostoma hopkinsi*), coastal shiner (*Notropis petersoni*), eels (*Anguilla rostrata*), and chain pickerel (*Esox niger*). As discussed above, sediment has accumulated in the project area streams from more than 100 years of extensive and destructive farming techniques prior to Federal ownership of the land. The aquatic species that now exist in the project area streams are a direct result of the existing sedimentation inherited at the time of becoming a National Forest. Sedimentation has the potential to limit reproduction of aquatic species and inhibit aquatic insect populations. The Forest Plan for the Chattahoochee-Oconee National Forests includes standards and guidelines, such as Georgia's BMPs for Forestry, designed to reduce or prevent sediment from entering streams and to maintain the hydrologic function of floodplains and wetlands.

Locally Rare Species

There are locally rare aquatic species known in the project area. Altamaha pocketbook (***Lampsilis dolabraeformis***) and Georgia elephantear (***Elliptio dariensis***) are on the Forest Locally Rare List (2004). The Georgia elephantear and Altamaha pocketbook were identified in the confluence of Falling Creek and the Ocmulgee River. These mussel species were evaluated and dropped from consideration due to their occurrence being outside the project area more than 15 miles north of the areas to be thinned. Caney Creek flows into a section of Falling Creek which is approximately 15 miles southwest of the proposed areas to be thinned. Surveys revealed no mussels were identified within project areas to be thinned (John Alderman, August 2002).

The proposed action would have no direct, indirect, or cumulative effects to these species.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Potentially affected aquatic PETS species were identified by (1) reviewing their general habitat preferences, (2) consulting records of known locations of PETS species prepared by the Georgia Natural Heritage Program (GNHP) historical records, (3) consultations with other agencies and universities, (4) reviewing data from PETS Risk Assessments for the Oconee National Forest, and (5) general observations. The following aquatic species are within the range of the Oconee National Forest based on a review of the above sources.

Common Name	Scientific Name	Status
Altamaha Shiner (fish)	*Cyprinella xaenura*	Sensitive
Ocmulgee Shiner (fish)	*Cyprinella callisema*	Sensitive
Robust Redhorse	*Moxostoma robustum*	Sensitive
Inflated Floater (mussel)	*Pygandon ibbosa*	Sensitive
Magarita Skimmer (insect)	*Macromia margarita*	Sensitive
Appalachian Snaketail	*Ophiogomphus incurvatus*	Sensitive

No listed Oconee National Forest PETS fish or mussel species were found within the project area during a 1998 survey. The Georgia Natural Heritage Database (August, 2004) was checked for the occurrence of Rare species information. The Georgia Heritage database listing of species for the Jones county area for aquatic species showed the Altamaha Shiner, Ocmulgee shiner, and Goldstripe Darter. The Goldstripe darter is not listed on our Forest Locally Rare list nor TES list. None of the surveys have confirmed the presence of the Goldstripe Darter, therefore the proposed action should not affect the species. The inflated floater, a freshwater mussel, lives in soft mud and sand, and in sand bars generally found in slow-moving water. This Ocmulgee shiner is known to occur within the Ocmulgee and Altamaha River Drainage. The Inflated floater was not found during surveys completed in 2002 or 2003. It is unlikely that the project would affect the species due to the absence of habitat in the project area.

The Ocmulgee shiner and inflated floater are not listed as being present in the project area within Jones County (see Georgia Rare Species information for Jones County within project file). Surveys conducted by the Center for Aquatic Technology Transfer (CATT) identified Ocmulgee shiner within the Caney Creek area located east of the project area. Altamaha shiners occur in the upper Altamaha River Drainage. Their preferred habitat is rocky and sandy pools of creeks and small rivers. This species was not detected during fish surveys done in 1995 (Caldwell, 2006).

Maps of the areas where Robust Redhorse has been discovered indicate this species is located south of Milledgeville, Georgia. However, reintroduction of the species into the Ocmulgee River was done in 2002. The Piedmont National Wildlife Refuge has ponds of Robust Redhorse being raised for release to reintroduce in rivers. It is likely that some fish may have washed into the tributaries of Caney Creek. However, no surveys have identified the Robust Redhorse in the Caney Creek area (per conversation with Jimmy Evans – GDNR Biologist August 2004). There should be no direct, indirect or cumulative effects to these aquatic species.

Insects that are listed on our sensitive list are the Margarita Skimmer and the Applachian Snaketail. These species have not been identified on the Oconee National Forest (See the Biological Evaluation in Appendix D).

Management Indicator Species

The Oconee National Forest hosts approximately 350 species of wildlife and fish and 1,500 species of plants (USFS, 2001). This great number of species makes it difficult to manage for every species on every acre of the Forest. Therefore, the USFS has identified 15 MIS for the

Chattahoochee-Oconee National Forest to represent the many different ecological communities and associated successional stages and species within the Forest. The primary objective with every project is to ensure that viability of any species present is not adversely affected. National Forests use MIS as a tool for identifying specialized habitats and creating habitat objectives and standards and guidelines. The idea behind the MIS concept is to identify a few species that are representative of many other species, and to evaluate management direction by the effects of management on MIS habitats. Both population and habitat data are used to monitor MIS on National Forests. Trends in MIS populations are normally assessed relative to trends in their respective habitat.

Of the 15 terrestrial MIS, 4 do not occur on the Oconee National Forest (or, in the case of birds, may occur, but do not breed on the Forest). These MIS include the black bear (*Ursus americanus*), smooth coneflower (*Echinacea laevigata*), chestnut-sided warbler (*Dendroica pensylvanica*), and ovenbird (*Seiurus aurocapillus*), (USFS, 2004b).

The following is a description of the 5 terrestrial MIS that do occur in the project area on the Oconee National Forest and the condition of their existing habitat. These MIS species are indicative of the major forest types in the project area and respond to changes in community diversity, successional diversity, and plant species diversity. The other 6 terrestrial MIS that do occur on the Oconee National Forest were evaluated in the project file.

Wood Thrush (Hylocichla mustelina)

The wood thrush is a forest interior species typically found in mature deciduous or mixed forests with a dense tree canopy and a fairly well-developed deciduous understory. Bottomlands and other rich hardwood forests are optimal habitats. The species is also found in pine forests with a deciduous understory (NatureServe Explorer, 2002).

Swainson's Warbler (Limnothlypis swainsonii)

Swainson's warbler is found in early-successional riparian habitats in the Piedmont, and is strongly associated with canebrakes, tangles, and thick shrubby understories of open bottomland hardwoods and mixed forests. The species is found in rich, damp, deciduous floodplain and swamp forests, requiring areas with deep shade from both canopy and understory cover. The species nests in understory canes, shrubs, vine tangles, and similar sites, typically within about 200 meters of open water (NatureServe Explorer, 2002).

Pine Warbler (Dendroica pinus)

The pine warbler is associated with pine and pine-oak forests, generally occurring only where some pine component is present. The highest numbers of the species occur where pure stands of pine are found; the species is less abundant as the proportion of hardwood tree species increases. Optimal nesting habitat for the species is provided by pure, dense, mature pine stands that lack a tall understory (NatureServe Explorer, 2002).

Red-cockaded Woodpecker (Picoides borealis)

Under the direction of the RCW Final EIS and ROD and the ESA, the Oconee National Forest must not jeopardize endangered species and must carry out programs for their conservation (16 U.S.C. 1536 (a)). Therefore, the Oconee National Forest must protect all cavity trees, protect foraging and nesting habitat, and provide future foraging and nesting habitat. The recovery objective is to create and protect enough RCW habitat to support a genetically sustainable population of 250 breeding pairs. There are currently seven inactive clusters and several acres of potential recruitment areas for the RCW on the Oconee National Forest.

The RCW uses open pinewoods, which can be longleaf (*Pinus palustris*), loblolly (*P. taeda*), shortleaf (*P. echinata)*, or slash (*P. elliotti*). Habitat is generally of mature trees (61+ years) with little or no midstory (resembling a park-like conditions). RCWs nest and roost each day in cavities they excavate in live pine trees (USFS, 2001; USFWS, 2002).

One active cluster of RCW are present in Compartment 9. Currently, potential foraging habitats within the project area of Jones County are fragmented and have thick midstory vegetation, which hinders RCW foraging and increases competition from other vertebrates. There are some early- to mid-successional stands of pine trees (future foraging and nesting habitat).

White-tailed Deer (Odocoileus virginianus)

White-tailed deer are very adaptable and use a variety of habitat types and successional stages to meet their year-round needs. Grassed openings and closed temporary roads, along with regeneration areas, supply the early successional habitats preferred by the species. Foraging habitat is represented in all forest age classes up to 80 years. Availability of browse and escape cover year-round and hard mast during the fall and early winter are key factors for white-tailed deer success. Riparian habitats supply much of the hard and soft mast (USFS, 2001; 2003c).

While there has been a slight decrease in the availability of deer browse on the Forest over the past 10 years due to a decline in early successional habitat, the white-tailed deer is very adaptable. Deer populations are higher on the Oconee (Piedmont) than in the Georgia mountains, with both populations stable to increasing. Since the deer population has been at or above carrying capacity in the Piedmont, State regulations have been liberalized to help reduce population densities to within habitat capability levels (USFS, 2003b).

Locally Rare Species

The Georgia Natural Heritage Database was checked for the occurrence of rare species information. This database lists the counties with the listing of rare species of concern throughout Georgia. The listing of species was Bog spicebush, Indian Olive, and Relict Trillium. The Bog Spicebush and Indian Olive have not been listed on the Chattahoochee-Oconee TES list or locally rare list. Oglethorpe oak, Bay starvine, and Schwerin Flase Indigo did not appear on

the list for Jones County. Botanical surveys conducted in 1999 or 2004 did not identify TES plants listed for the Oconee NF.

From a list of 24 animal species (not including aquatic species) for the Chattahoochee-Oconee National Forest in 2004, only the Four-toed salamander (***Hemidactylium scutatum)*** was found on the Georgia Heritage database. The Four-toed salamander has been recorded from the Hillsboro Northwest, Southwest, and Southeast Quarter Quads, all of which are some distance from the project area. The four-toed salamander is known to inhibit swamps, boggy streams, ponds, and wet woods (GADNR, 2003). The proposed areas to be thinned would not occur within these areas. The Forest Plan protects riparian areas and wetlands. Buffers are applied to protect these areas.

From a list of 30 aquatic species two locally rare species the Altamaha pocketbook (***Lampsilis dolabraeformis***) and Georgia elephantear (***Elliptio dariensis***) are listed on the Chattahoochee-Oconee List for 2004, and were identified by surveys conducted by John Alderman, within the confluence of Falling Creek and the Ocmulgee River. The areas where these species were identified are 15 miles north of the project areas. These species were discussed in the Aquatic section (3-3). Proper mitigations, following Best Management Practices (BMP's), and protection of riparian areas will minimize any erosion to the proposed project area.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

There are 116 species (26 Federally listed and 90 sensitive) on the Chattahoochee-Oconee National Forest PETS species list. From this list, potentially affected species were identified by: 1) reviewing their general habitat preferences, 2) consulting records of known locations of PETS species prepared by the GNHP historical records, and 3) consultations with other agencies and universities, as well as reviewing data from Neotropical Migratory Bird (NTMB) Point Samples, GDNR Bald Eagle Flights, Breeding Bird Census Routes, PETS Risk Assessment for the Oconee National Forest, and general observations (Caldwell, 2006). The following 12 terrestrial PETS species are within the range of the Oconee National Forest based on a review of the above sources.

Common Name	Scientific Name	Status
(Plants)		
Relict trillium	*Trillium reliquum*	Endangered
Oglethorpe oak	*Quercus oglethorpensis*	Sensitive
Scherwin's false indigo	*Amorpha schwerinii*	Sensitive
Bay Starvine	*Schisandra glabra*	Sensitive
(Terrestrial Animals)		
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Bald eagle (nests)	*Haliaeetus leucocephalus*	Threatened
Wood stork (foraging habitat)	*Mycteria americana*	Endangered

Bachman's sparrow	*Aimophila aestivalis*	Sensitive
Migrant loggerhead shrike	*Lanius ludovicia migrans*	Sensitive
Rafinesque's Big-eared bat	*Corynorhinus rainesque*	Sensitive
(Aquatics)		
Altamaha Shiner	*Cyprinella xaenura*	Sensitive
Inflated Floater	*Pygandon gibbosa*	Sensitive
Ocmulgee Shiner	*Cyprinella callisema*	Sensitive
Robust Redhorse	*Moxostoma robustum*	Sensitive
(Insects)		
Appalachain snaketail	*Ophiogomphus incurvatus*	Sensitive
Margarita river skimmer	*Macromia margarita*	Sensitive

Of these, all but 5 were dropped from further consideration because their range does not extend into the project area or their specific habitat requirements are not found in the areas of proposed activities. A detailed rationale for elimination of these species is presented in the project file.

Relict Trillium

The Georgia Natural Heritage Program listing by county did show the occurrence of relict trillium within the Jones County area. Relict Trillium has been identified within Jones County but more than 5 miles from the project area on private lands and not within the Oconee National Forest. Occurrences for this species usually will be north facing slopes within hardwood areas with mesic soils. Soils where PETS plants usually occur within the Piedmont area usually are within the Iredell soils. Iredell soils may be present within the areas throughout the Hitchiti near the Falling Creek areas. However, the project area lies east of the Falling Creek area and Ocmulgee River.

Red-cockaded Woodpecker (RCW)

The RCW currently occupies habitat on the south end of the Oconee Ranger District and the Piedmont National Wildlife Refuge within the project area. It is most abundant on the Hitchiti Experimental Forest (14 active cluster sites) and the Piedmont National Wildlife Refuge (39 cluster sites). This species uses open pinewoods, which can be longleaf, loblolly, shortleaf, or slash. Habitat is generally of mature trees with little or no midstory (resembling a park-like stand). RCWs nest and roost each day in live pine trees. The dead pine trees (snags) created by the SPB infestation are an ephemeral foraging habitat, which will soon disappear. RCW are located in the project area and protection from further SPB infestation is necessary to provide for future foraging and nesting habitat. Several acres of potential recruitment areas for the RCW exist within the project area (Caldwell, 2006).

Bachman's Sparrow

This species is found within open southern pine forests subject to frequent fires. The specific habitat this species prefers is large areas of well-developed bunch grass and herb layer with limited shrub and hardwood midstory. This bird has not been detected in five years of inventories on the Forest. Bird inventories are done on the forest yearly. Reports from the GDNR and the Piedmont National Wildlife Refuge found several RCW sites in the Refuge with Bachman sparrows present last year. Even though this species has not been reported on the Oconee National Forest in the past, it did occur within some stands last year within the RCW areas (Caldwell, 2006).

Altamaha Shiner

This species occurs in the upper Altamaha River Drainage, North Central Georgia. The only area where this species is found includes both the north-central Ocmulgee and Oconee Systems. The 5th level watersheds that may include this species are Oconee River-Greenbrier Creek, Ocmulgee River-Rum Creek, Little River-Lower, and Apalachee River –Lower watersheds on the Oconee National Forest. This species of fish is listed as S2 (Imperiled) by the NatureServe database (NatureServe, 2003). Surveys conducted in September 2003 did not identify the Altamaha Shiner within this project area. Identifications were made in watersheds outside the Oconee National Forest.

Ocmulgee shiner (Cyprinella callisema)

This species of shiner (fish) is located in a small range of streams in Georgia, but common and stable in preferred habitat within the Ogeechee (uncommon) and Altamaha (locally common), river drainages (NatureServe, 2003). The 5th level watersheds that may include this species are Oconee River-Greenbrier Creek, Ocmulgee River-Rum Creek, Little River-Lower, and Apalachee River –Lower watersheds on the Oconee National Forest. This species of fish is currently listed as a S3 (Vulnerable) within the NatureServe database (NatureServe, 2003).

This species is usually found in larger streams in open sand (usually) and/or gravel bottomed channels with water and little if any vegetation. Sandy and rocky rivers of small to medium size may also contain habitat for this species. The rivers and creeks here on the Oconee are likely to have habitat that would meet these requirements. The species has been identified by the DNR within the Ocmulgee and Altamaha River drainages. These areas of identification were several miles from the National Forest. A survey conducted September 2003 by the Center for Aquatic Technology Transfer (CATT) Research Team from Asheville, North Carolina surveyed surrounding tributaries of the Apalachee, Oconee, and Ocmulgee Rivers for the species. The Ocmulgee Shiner was identified in the Caney Creek area north of the project area.

3.2.1.2 Environmental Consequences

Habitat alteration changes the diversity and abundance of wildlife species in a given area. Vegetation management can affect each species' habitat in a different way, benefiting some species, while harming others. Planning regulations define diversity as "the distribution and abundance of different plant and animal communities and species within [an] area…" (36 CFR 219.3(g).

In general, forested areas that are in various stages of development and include periodic openings support a wide diversity of species and habitats. The maintenance of forest habitat diversity tends to increase wildlife populations and land values, since the majority of animals do not utilize a single stand or single forest type throughout their lives. Management activities that encourage layering of different types of vegetation such as prescribed burning, thinning and occasionally herbicides increase wildlife diversity. Impacts beneficial to wildlife are typically greater with a combination of management activities versus any of the treatments separately.

Alternative 1 (No Action: Current Management)

Vegetation

Under Alternative 1, no harvest activities would occur. Without the increased light to the forest floor provided by thinning, understory development would be limited to that produced naturally, and that produced as a result of occasional prescribed burns. Any understory development would be limited to woody vegetation, such as sweetgum, red maple, pine seedlings, blackberry, and dogwood. Only small increases in grasses and legumes would occur, most often near roadsides and in openings. Soil conditions in the project area would remain intact, and no reductions in soil plant productivity would occur.

In the absence of thinning harvests, the general health of forest stands in the project area would likely decline gradually and stabilize at a new lower level. The incidence of SPB attacks, which are significantly decreased by reducing stand density and removing infected trees from a given stand, would increase, as infected trees spread the beetle to those trees nearby. Forest stands in the project area would continue to develop overcrowded conditions, resulting in greater competition for nutrients, decreased growth, and increased potential for infection and insect attack, as well as increased natural mortality rates. Given the real possibility of SPB attacks under these conditions, an increase in salvage logging operations may become necessary.

Under Alternative 1, no noxious weed control would occur within the project area. If left uncontrolled, noxious weeds would continue to spread, would take over surrounding natural vegetation, and would become a much bigger problem over the long-term. Tree health would decline, which could increase the susceptibility of trees to SPB infestations.

General Wildlife

Under Alternative 1, no harvest or other vegetation management activities would occur. The forest stands within the project area would continue to mature, and canopies would gradually close, reducing light and decreasing understory vegetation. Understory vegetation would

primarily consist of shade-tolerant species, and herbage would be sparse. Implementation of this alternative would benefit those species dependent on mature forest for foraging habitat and cover.

Over time, seedling/shrub habitat within the project areas would develop into poletimber habitat, which would then develop into sawtimber habitat. This progression would create a more mature and continuous forest canopy, benefiting wildlife that requires this type of habitat. However, over a prolonged period of time, the abundance of sweetgum and other pioneering species within the project area would increase, and these would slowly overtake pine and hard mast species. This could be detrimental to those species that prefer pine or mixed pine forests.

Early successional habitat and edge habitat would not be created, unless pine mortality occurs. Gap-phase dynamics would likely occur, where some trees within the stands die for a variety of reasons, and are replaced by trees in the midstory or by new reproduction. Small areas of early successional habitat may be created as pine mortality occurs. As trees die, increased sunlight would reach the floor in those locations, resulting in increased herbaceous understory growth in those areas. However, breaks in the forest canopy as a result of dead or dying trees would be short-term, as surrounding trees grow and close up the canopy (Baker and Hunter, 2002).

Implementation of Alternative 1 would increase the potential for SPB infestation within the project area. If SPB infestation were to occur within these areas, sanitation cuts would be necessary to control the disease. Sanitation cuts would result in small clearcut areas within the forest stand, which would be beneficial to some species by providing openings, early successional habitat, and edge habitat, but could be detrimental to other species, including forest-interior species.

Under Alternative 1, there would be no deliberate attempts to create wildlife habitats within the project area. While none of the benefits on wildlife from these activities would occur, this alternative would adversely affect some wildlife because existing conditions would continue.

Aquatic Species

Under Alternative 1, no additional direct impacts on aquatic species, including PETS species, would occur. However, as discussed above, erosion from deteriorating road conditions would continue to occur, and could worsen over time, adversely impacting aquatic species in the area over the long-term. Effects on aquatic species from sedimentation are discussed in detail under Alternative 2 below. However, these adverse impacts under Alternative 1 would be minor in intensity.

Management Indicator Species

Wood Thrush (Hylocichla mustelina)

The project area would continue to provide habitat for the wood thrush under Alternative 1, benefiting the species over the long-term. Deciduous species would continue to increase in the

understory and midstory of the project area under this alternative, and the tree canopy would continue to be dense, providing suitable habitat for the wood thrush. Over time, portions of the project area, particularly areas of mixed forest and deciduous forest, would likely become more suitable for the species, and populations of the species in the project area would likely increase.

Swainson's Warbler (Limnothlypis swainsonii)

Implementation of Alternative 1 would have no effect on early-successional riparian or deciduous floodplain/swamp forested habitat for the Swainson's warbler. Habitat trends and patterns for this species in the area would continue.

Pine Warbler (Dendroica pinus)

Implementation of Alternative 1 would have an adverse effect on the availability of pine warbler habitat in the project area. Without the proposed vegetation management, the proportion of pioneering hardwood species in the understory of the project stands would increase, decreasing the suitability of the area for the pine warbler over the long-term.

Red-cockaded Woodpecker

Habitat for the RCW would not be favored or created under Alternative 1. Although the pine stands within the project area would become more mature with time under this alternative, they would continue to be overstocked and would become more crowded. Over time, potential RCW foraging and nesting habitat within the project area would become less suitable as future habitat for the species. Although Alternative 1 would not directly affect the RCW, indirect effects on potential habitat for the species would be adverse.

Currently, much of the potential RCW foraging habitat within Jones County has thick midstory vegetation, which hinders RCW foraging and increases competition from other vertebrates. Under Alternative 1, the overstocked stands of early- to mid-successional pine trees (potential RCW foraging and nesting habitat) would continue. The USFS would neither be protecting existing habitat nor providing future foraging and nesting habitat for the RCW in the project area under this alternative. RCW would not be able to be recruited to the project area in the future if no vegetation management activities are conducted.

White-tailed Deer

Implementation of Alternative 1 would not affect the white-tailed deer or its habitat on the Forest, since this species utilizes so many different habitat types and is extremely adaptable. The project area would continue to provide habitat for the species over the long-term, and populations would be expected to continue under current trends and patterns.

Locally Rare Species

Since no locally rare terrestrial plants are known from the project area, implementation of Alternative 1 would not have any effect on these species. Locally rare aquatic species would not be affected by the implementation of Alternative 1. The Four-toed salamander would not be affected by the implementation of Alternative 1.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Relict Trillium

Alternative 1 would have no effect on the Relict Trillium .

Red-cockaded Woodpecker

The No Action alternative may adversely affect the species and would result in a violation of the ESA, RCW EIS guidelines, the RCW Recovery Plan, and the current Forest Plan for the Chattahoochee-Oconee National Forest.

Bachman's Sparrow

Bachman's sparrow habitat would not be promoted under Alternative 1, and potential habitat for the species within the project area would be lost over the long-term.

Altamaha Shiner

Alternative 1 would have no effect on the Altamaha shiner.

Ocmulgee shiner

Alternative 1 would have no effect on the Ocmulgee shiner.

Alternative 2 (Proposed Action: RCW Habitat and Canebrake Restoration)

Aquatic Species

Aquatic organisms depend on numerous physical stream characteristics for survival, including temperature, dissolved oxygen, turbidity, light, nutrients, sediment particle size, and flow. Impacts on aquatic species and habitats resulting from vegetation management activities are indirect, and occur as a result of impacts on water quality and quantity, as well as changes in surrounding habitat. The potential for water quality impacts resulting from vegetation management increases with an increase in the severity of site disturbance, as discussed above. Many of these effects can be greatly reduced through the use of BMPs.

Harvest and Midstory Control

As discussed above, harvest and midstory control activities have the potential to affect the water quality of streams and indirectly affect aquatic organisms and habitat in those streams within and adjacent to the project area through the clearing of vegetation, soil disturbance, and compaction associated with the use of heavy equipment. Increased surface water runoff from compaction and vegetation removal can increase stream flow and storm flow, which can lead to stream channel scouring, stream bank erosion, increased sedimentation and nutrients, and flooding, all of which can impact aquatic organisms (Fulton and West, 2002; USEPA, 2001; Miller, 1987).

Runoff contains suspended sediments and cation nutrients; the amount of sediment and nutrients in runoff increases as the amount of overstory in the area decreases (Schultz, 1997). Increased sediment loads could potentially reduce water quality and may adversely affect fish or spawning areas. Sedimentation to streams increases turbidity and suspended solids in the water, which could block sunlight, impair photosynthesis by algae and aquatic plants, reduce oxygen replenishment, and harm fish respiratory systems. Once deposited on stream bottoms, sediment can adversely affect spawning areas, bury or smother eggs and fry, prevent larvae emergence, and fill in pools that are essential as fish cover (USFS, 1989a; USEPA, 2001; Seehorn, 1987; Gucinski et al., 2001).

Nutrient losses tend to increase proportionately with sediment losses (Schultz, 1997). Increased nutrient runoff to streams can have either adverse effects (Lemly, 2000) or potentially beneficial effects, depending on the level of nutrient runoff, and the current nutrient content of the streams (Tank and Webster, 1998). Many aquatic systems are nutrient poor, and therefore, small increases in nutrients can improve their productivity (USFS, 1989a). Nutrient runoff may adversely affect fish species through the proliferation of algae or other microorganisms (algal blooms) (Lemly, 2000; USEPA, 2001), which can increase biological oxygen demand, and therefore, decrease levels of dissolved oxygen in waterbodies (USEPA, 2001).

However, harvest and midstory control under Alternative 2 would only remove a portion of the trees from the project area; there would still be many trees remaining. Loblolly pine stands are well-suited for promoting site stability and minimizing surface water runoff and soil erosion. Loblolly pines control erosion through shedding needles that resist surface water movement on the forest floor (Schultz, 1997), thereby reducing sediment and nutrient delivery to nearby streams, which might otherwise be harmful to aquatic communities. In addition, residual cover requirements in riparian zones reduces the potential for changes in water temperature due to reduced stream bank shading.

Surface water runoff and erosion, and subsequent impacts on aquatic species, from thinning and midstory control would be highest immediately following tree removal. As discussed above, these impacts would be short-term, lasting only until understory vegetation in thinned areas begins to grow, and would be minor with implementation of *Georgia's BMPs for Forestry* and Forest Plan standards and guidelines. Understory vegetation would increase rainfall infiltration, reducing surface water runoff and soil erosion in the area, and thus reducing adverse impacts on water quality and aquatic organisms. No significant adverse impacts on aquatic species or their habitat are expected to result from the proposed thinning, reforestation and midstory control activities under Alternative 2.

Road Rehabilitation/Construction and Maintenance (including Log Landings/Skid Trails)

As discussed above, some road maintenance and temporary road construction and reopening would be necessary for conducting the proposed activities. The vast majority of adverse impacts from roads on aquatic species result from direct effects on their habitat, including changes in water quality, water temperature, and hydrology (Gucinski et al., 2001). Road construction adjacent to stream channels poses the highest risk for adverse impacts on aquatic organisms. However, under Alternative 2, no new temporary roads would be constructed or reopened within the established riparian corridors.

Under Alternative 2, adverse effects on aquatic species and habitats would be minimized through proper planning and subsequent rehabilitation of skid trails, log landings, and roads, and by following Georgia BMPs, as discussed above directly under water quality. Sedimentation impacts from temporary road construction and use for thinning activities would be short-lived, occurring at the highest levels during and for a few years after road construction. Impacts would decrease in intensity as the road surface and cut-fill slopes stabilize, and roads begin to revegetate (Fulton and West, 2002; Gucinski et al., 2001). Therefore, only minor, short-term, adverse effects on aquatic species are expected to occur from temporary road rehabilitation or construction under Alternative 2.

Canebrake Restoration

Under Alternative 2 the overstory would be reduced to BA of 40 on 15 acres. This action would slightly increase the stream temperature near the areas of the treatment and allow more light to reach the stream course. The effects would be local in proximity to the restoration sites and would result in minimal change downstream. The girdling of trees for canebrake restoration in Alternative 2 would exclude trees on the stream bank. The only slight effect that might occur is girdling of trees with a large crown that extends over the stream but the base of the tree is a fair distance from stream bank. In this case there could be some local temperature elevations but the stream temperatures should quickly recover downstream under shaded conditions. These actions would not be expected to elevate the stream temperature significantly.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Implementation of Alternative 2 would not directly impact the Ocmulgee Shiner, Altamaha Shiner, or the Robust Redhorse due to the location of the project area. The nearest project area location (C-9) is located almost 4 miles east of the Ocmulgee River and does have tributaries that would eventually flow into the Ocmulgee River. The Proposed Action to implement vegetation management by thinning the project areas will not impact the sensitive aquatic species listed on the Oconee National Forest. Currently, a recovery plan is being developed to help make sure the Robust Redhorse is not listed as endangered. The Robust Redhorse Conservation Committee (RRCC) and GDNR Recovery Team meet annually to discuss the locations and progress of the studies of reintroduction and management objectives (Caldwell, 2006).

The preferred habitat is rocky and sandy pools in creeks and small rivers. There is existing habitat for this species in the streams within the project area. According to Chris Skelton (Ga DNR Fisheries Biologist) identification of the Altamaha shiner was found within the Murder Creek tributary (per conversation on October 20, 2000), which is northeast of the project area within Putnam County approximately 25 miles. Fish surveys done in September 2003 show that there is potential habitat that would host the species within the locations of Apalachee-Lower, Oconee River-Greenbrier Creek, and Ocmulgee River-Rum Creek watersheds (per conversation with Craig Roghair, September 2003). Limiting factors would include the loss of water quality and high loads of sedimentation due to erosion. The Altamaha Shiner was not identified within the Caney Creek Area but within the Falling Creek tributary which is southwest of the project area approximately 5 miles.

Management actions that would propose or create adverse effects would be those that disturb soil, potentially causing erosion and sedimentation levels to increase. Vegetation alterations within the watersheds would potentially increase water flow into streams. The Riparian Prescription included in the Revised Plan provides direction designed to maintain and enhance water quality. Therefore, plan implementation should have little potential for adverse impacts to individuals. Throughout the Oconee National Forest many private lands are currently in a degraded state due to increased development and agricultural use, making presence of quality habitats on national forest land increasingly important to the species. Following the State BMPs and streamside management zones will minimize any disturbance to the streams and wetlands, and should prevent any impacts to fish and other aquatic species.

Vegetation

Harvest and Midstory Control

Under Alternative 2, thinning would remove both non-hard mast-producing hardwoods (sweetgum, elm, and maple) and softwoods (loblolly pine). Thinning would have slightly different effects on vegetation, depending primarily on the age class of the stand and the level of harvest extraction. Thinning activities would promote optimal tree spacing and improve the health of the forests in the area. Evidence suggests that the increase in tree growth vigor and selective cutting of diseased and stressed trees significantly reduces the risk of loss from SPB attacks and other diseases (Belanger et al., 2000).

Thinning generally results in greater light penetration to the forest floor, and as a result, induces both woody and herbaceous understory growth. Vegetation diversity on the forest floor would increase immediately following thinning, with the greatest diversity and abundance likely to occur within the first six to eight years (Miller et al., 1995). Without further vegetation control, the abundance of grasses and forbs would slowly diminish with development of woody vegetation in the shrub and subcanopy layers, and as the tree canopy slowly closes. However, under Alternative 2, a combination of herbicide use, mechanical treatments and prescribed burning to control midstory vegetation within thinned areas and areas immediately adjacent to thinned areas would reduce the development of woody vegetation and promote and maintain understory growth. Prescribed fire would be conducted during the dormant season and growing

season, depending on location and time of year. Dormant burns are conducted when herbaceous plants are below ground and not impacted by fire.

Thinning activities do come with some biological risks, including potential for physical damage that can occur to residual trees as a result of the harvesting process, to soils on which future plant growth and/or biomass production may be reduced (i.e., on highly eroded or compacted areas), and to existing shrub and herbaceous vegetation damaged as a result of the harvesting process. Physical damage to residual trees as a result of harvesting activities is normally minor. Sites would be reviewed and approved prior to harvest to ensure that log landing and skid trail locations are appropriately planned to minimize soil impacts and damage to residual trees. Damage to existing shrub and herbaceous vegetation during the harvesting process would be temporary, and plants in the understory would quickly regain their vigor due to increased light availability to the forest floor.

Road Rehabilitation/Construction and Maintenance

Temporary road construction and reopening operations, as well as construction of log landings and skid trails, would require the clearing of vegetation within the road right-of-way, as well as the disturbance and compaction of soils along the road travel way. Thus, road construction would result in both the direct removal of vegetation and in a reduction in the ability of soils along the roadway to support plant growth. The extent of the vegetation clearing would be dependant on how long it has been since the temporary road was last used (i.e., cleared). Reopening temporary roads within the project area would likely require the removal of woody vegetation and shrubs, and potentially a few saplings. New temporary road construction, on the other hand, may involve the removal of larger trees. However, only a small amount (approximately one mile) of temporary road is proposed for construction under Alternative 2. Therefore, removal of this vegetation would not likely have a noticeable effect on forest cover or forest health.

For the most part, impacts on vegetation from temporary roads, log landings, and skid trails would be short-term. The majority of these areas would be seeded with native vegetation upon completion of timber harvest activities and allowed to vegetate. This would increase the proportion of the stand covered by grasses and legumes, provide forage for wildlife, and decrease the amount of time required to rehabilitate compacted or disturbed soils. Small trees would quickly develop along these sites from seed sources in the nearby stands; however, these areas would continue to have reduced soil productivity and full recovery may take many years (USFS, 1989a). Soil compaction effects on these sites are generally long-term; as a result, soil productivity can be reduced for decades. However, the USFS would require that compacted areas be tilled prior to seeding to reduce the potential for this adverse effect.

Pre-haul and heavy pre-haul maintenance activities may involve removal of some roadside vegetation to increase visibility and enhance surface conditions. However, any impacts on vegetation resulting from these activities would be minimal, as only early successional vegetation would be removed or damaged. No new system road construction would occur under Alternative 2.

Other Activities

Of the other activities proposed under Alternative 2, eradication of the noxious weeds within the project area would have the greatest effects on vegetation. Adverse impacts on non-target and natural vegetation during herbicide application would be negligible, due to the use of direct foliar spray herbicide delivery methods. Any adverse effect on natural vegetation resulting from herbicide use would be short-term in duration, as any killed vegetation would quickly be replaced with new vegetation.

Rather, long-term, beneficial effects on vegetation would occur as a result of this activity. Efforts to eradicate kudzu and privet from the project area would allow natural vegetation to reestablish in infested areas, and would prevent the potential for the invasive species to spread onto adjacent sites and kill the vegetation on those sites. Further analysis of herbicide use effects are covered in the Environmental Analysis for Herbicide Use (USDA 2005).

General Wildlife

Harvest and Midstory Control

Vegetation management activities can affect wildlife directly through disturbance, injury, or mortality. While the use of heavy equipment during thinning activities could cause some direct mortality of some animals, most animals would temporarily move from the area during thinning activities due to human disturbance and the noise generated from the equipment. Typically, vertebrate species are able to escape in advance of equipment and not be harmed. However, some reptiles and amphibians may be killed by equipment (USFS, 1989a). Because of large populations, direct mortality of some individuals would not hurt populations as a whole. Noise generated from the use of heavy equipment or hand-held equipment for midstory control would temporarily disturb and/or startle wildlife within and adjacent to the project areas, and could cause the temporary displacement of these species. Noise from these activities may also cause nesting birds to abandon nest sites and their young, if harvest activities occur during nesting season. However, since noise-generating equipment would only be used for a short duration, any displaced wildlife would be expected to return to the area upon completion of activities. In addition, there would be undisturbed forest stands in each of the compartments, as well was in other surrounding compartments, for the displaced wildlife during vegetation management activities.

Vegetation management activities can also affect wildlife indirectly through short-term and long-term habitat alteration. Although thinning and midstory control can temporarily reduce cover, food sources, and habitat from site preparation activities and the timber harvest itself, thinning also reduces the basal area (BA) and canopy coverage within stands over the short-term. Opening up the forest canopy encourages understory growth and leads to improved wildlife habitat. Thinning allows light to reach the forest floor, which increases the amount and growth rate of wildlife food plants, including berries, forbs, and shrubs (Schultz, 1997; Baker and Hunter, 2002). Reducing the proposed treatment stands to approximately 60 BA under

Alternative 2 would considerably open up the forest stand, most noticeably in stands that currently have the highest BA. Approximately 80 acres would be thinned to 40 BA as part of a shelterwood treatment.

In addition to thinning, midstory control would be conducted within the project area, both on thinned stands and on some adjacent stands that would not undergo thinning. Midstory control would result in a more open forest setting, and would further increase understory growth by increasing available sunlight and nutrients.

Thinning activities themselves neither create openings nor result in forest fragmentation. Although the major forest composition post-thinning would remain basically the same as pre-thinning conditions, vertical diversity would increase as the amount of understory species increases and as diameter growth of remaining trees increases. In loblolly pine stands, as the vertical diversity of vegetation increases, the number of wildlife species within the stand increases (Schultz, 1997). Thinning in dense stands can increase timber volume within the stand, and provide enhanced bird habitat (Meyers and Johnson, 1978).

In some cases, individual trees that are beneficial to wildlife due to their form may be removed during thinning, although den trees with cavities are present and snags are retained per the minimum management requirements in the Forest Plan. Removal of trees used for nesting by birds could result in forceful abandonment of nest sites or direct mortality of young birds if thinning is conducted during nesting season.

Increases in forest health resulting from thinning also have beneficial impacts on wildlife. Animal diversity is closely related to plant diversity (USFS, 1989a). Soon after thinning is conducted, vigorous growth in the understory begins in response to the increase in light reaching the forest floor in thinned areas (Schultz, 1997; Cain, 1995). From this stage through the next few years, the abundance of birds and small mammals is typically the greatest. In response to an increase in prey activity, predatory mammal and raptor populations would increase in abundance (USFS, 1989a; Baker and Hunter, 2002; Perkins et al., 1988). This impact would be greatest in the stands proposed for a greater reduction in BA.

One- to two-year vegetation consists of dense stands of forbs and perennial grasses that make excellent habitat for small herbivores and small seed-eating mammals. However, most forage components, including herbage, vines, grasses, and woody vegetation, decrease with stand age (Mengak et al., 1988). In the third and fourth years, the grasses are replaced with shrubs, which do not favor the small seed-eating mammals, but does improve habitat conditions for birds. Under Alternative 2, midstory control and the use of prescribed burning on a three to five-year cycle would work to maintain forbs and perennial grasses in the understory of selected stands within the project compartments.

Road Rehabilitation/Construction and Maintenance

Under Alternative 2, roadwork would be conducted to allow for access to stands proposed for timber management activities, and would consist of road maintenance, rehabilitation, and

temporary road reopening and construction. These activities would increase the amount of human disturbance to wildlife during vegetation management activities and disturb any nesting sites in the affected area. The creation and use of log landings and skid trails would remove trees and understory vegetation, which currently serve as food sources, escape cover, and breeding/nesting sites for wildlife.

During temporary road construction and reopening, a 12 to 15-foot-wide path would be cleared of trees and other vegetation. Since the treatment stands are proposed to be reduced to 60 BA, this small path width would not be any larger than the distance between trees in the project area post-thinning. Temporary road construction and reopening would likely neither result in an edge effect along the road, nor contribute to forest fragmentation.

Most of the temporary roads would not be surfaced/graveled; gravel would only be spread in dips, on steeper slopes, and at intersections with surfaced roads. Herbaceous vegetation would likely encroach onto the less often used portions of the roads long before road closure, which could provide early successional habitat for some species during thinning activities. However, it is unlikely that this habitat would be greatly used due to the presence of workers and disturbance from activities.

Upon completion of vegetation management activities, the majority of temporary roads, log landings, and skid trails would be seeded with native vegetation and allowed to fully vegetate. The seeding mixes include seed plants that are beneficial to wildlife as a source of forage and as a year-round source of seeds. Seeding of temporary roads would benefit wildlife by creating wildlife strips. These areas would also benefit insectivorous birds, since insects are more abundant in grasses than in thick forest floor litter. The open habitat created in these areas would benefit those species that prefer early successional habitat. Over time, as the surrounding forest matures, grasses and forbs in these areas would be shaded out and the forest canopy would close, and species that prefer mature forested habitat would be favored. However, to maintain a diversity of habitats within the project area, some log landings scattered throughout the project area would be maintained permanently as wildlife openings. These areas would provide early successional habitat for wildlife over the long-term. **Table 3.2-1** lists those stands, by compartment, in which a log landing would be maintained as a wildlife opening over the long-term.

Table 3.2-1. Locations of Log Landings to be Maintained as Wildlife Openings by Compartment and Stand

Compartment	Stands
7	2, 5, 51
9	6, 9, 11, 12, 16
10	2, 6, 9, 12

Other Activities

In addition to the above-mentioned harvest, midstory control, and road reconstruction/ maintenance activities, approximately 45 acres of old SPB sites would be reforested with pine

seedlings within the project area under Alternative 2. These areas range in size from 0.25 acres to several acres. While these sites currently provide early successional wildlife habitat, this habitat will only be available over the short-term, as early pioneering species would quickly establish and take over these areas if no action were taken. Reforestation of these sites with pine would provide for more continuous pine habitat over the long-term within the project area. Approximately 80 acres of shelterwood treatments will be treated with artificial and natural regeneration, with the remaining overstory retained indefinitely.

Management Indicator Species

Wood Thrush (Hylocichla mustelina)

The project area may currently contain a small amount of suitable habitat for the wood thrush. While mature, deciduous forested habitat would remain largely unaffected by project implementation, pine and mixed forested habitat that may currently be suitable for the wood thrush within the project area due to a dense tree canopy and a well-developed deciduous understory would become less suitable as a result of Alternative 2. Alternative 2 would reduce the deciduous understory/midstory component of the affected stands, and thinning activities would result in a much less dense forested canopy. However, since the habitat affected by the project is not optimal wood thrush habitat, implementation of Alternative 2 would only have minor adverse effects on wood thrush habitat, but would not noticeably affect its overall habitat availability on the Forest.

Swainson's Warbler (Limnothlypis swainsonii)

The project area may currently contain a small amount of suitable habitat for Swainson's warbler. Habitat for Swainson's warbler is found in bottomland sites near water. Canebrake is a normal nesting site. Alternative 2 is attempting to restore 15 acres of canebrake in Compartments 7 and 9 which will provide additional habitat for this warbler. This alternative will have a beneficial effect on Swainson's warbler.

Pine Warbler (Dendroica pinus)

The pine warbler would be beneficially affected by implementation of Alternative 2. Under this alternative, midstory control would be undertaken in pine stands to decrease the density of midstory, including the hardwood component. This would make the project area more suitable as pine warbler habitat. In addition, reforestation of old SPB spots would provide more continuous pine forest cover in these areas. This would amount to a slight increase of suitable habitat for the pine warbler over the long-term.

Red-cockaded Woodpecker

Activities proposed under Alternative 2 would enhance the quality of RCW habitat on the forest. Opening up the pine forest through thinning, with a focus on mature pine stands, and conducting midstory control through mechanical methods would not only improve forest health and reduce

threats on RCW clusters from SPB infestations, but would make the project area more suitable for the RCW nesting and foraging. In combination with past and proposed future prescribed burning, which would maintain midstory control, the vegetation management activities under Alternative 2 would create ideal habitat for the RCW within the project area. Vegetation management in immature pine stands would enhance potential future habitat for the species within the project area, once the stands have matured. Likewise, old SPB spots that have undergone salvage cutting would be reforested with pine seedlings under Alternative 2. This would provide for additional future habitat for the RCW within the project area, as well as more continuous, pine forest stands.

Upon completion of vegetation management activities (thinning and burning) under Alternative 2, 30 RCW recruitment sites would be established within the project area. Inserts would be placed throughout these sites, which would provide nesting habitat for the species. The boundaries of RCW areas would be marked and monitored to ensure protection of the species and the habitat.

Alternative 2 would be working toward the recovery objective for the RCW on the Oconee National Forest. In addition, this alternative would be keeping with the direction of the RCW Final EIS and ROD, Recovery Plan, and the ESA.

White-tailed Deer

Thinning would benefit the white-tailed deer by encouraging shrubby and grassy understory areas by opening up the forest canopy. Temporary roads, skid trails, and log landings that are reseeded would provide grasses for an early spring source of forage and as a year-round source of seeds. Alternative 2 would create habitat for the white-tailed deer within the project area, and the species would likely be more attracted to the area. Maintenance of early successional habitats in wildlife openings would supply high-quality browse for this species over the long-term.

Locally Rare Species

Since no locally rare plants are known from the project area, implementation of Alternative 2 would not have any effect on these species. Although the four-toed salamander is known to inhabit swamps, boggy streams and ponds, and wet woods within or adjacent to the project area, Alternative 2 would not affect these areas (due to riparian corridor restrictions). The mussel species listed on the locally rare list would not be affected by Alternative 2 due to the riparian and corridor restrictions and BMP's. Therefore, no effects on locally rare animal or aquatic species or their habitat would occur as a result of Alternative 2.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Relict Trillium

Based on the information from the Georgia Natural Heritage database, district surveys, soil information, and general observations no identification of the listed species has occurred within the project area. In addition, contractor John Paul Schmidt conducted a FY 1999 plant survey (1000 acres) on the Oconee National Forest within the Hitchiti Experimental Forest within the 10 compartments in June 1999. There were no PETS plant species found within the project areas of pine and pine-hardwood habitat. Several acres that were surveyed are similar habitats including loblolly pine as the main species. The majority of the areas to be thinned are upland pine and very xeric sites. A contractor conducted a plant survey (FY 2004) within some areas to be thinned and no TES species were located. Therefore implementation of Alternative 2 is not likely to adversely affect the relict trillium.

Red-cockaded Woodpecker

Effects from Alternative 2 on the RCW and its habitat are more fully discussed under MIS above. The immediate effect of thinning within the project area under Alternative 2 may be the loss of some foraging habitat. However, beneficial effects on RCW habitat would be anticipated over the long-term. SPB infestations have been serious during the past couple of years. This infestation has occurred because of the lack of reducing the stems per acre. Therefore, the removal or cutting of dense trees would result in a cumulative beneficial effect, since it would stop the spread of the SPB infestation and minimize loss of habitat. Based on the information that is in the project file, RCW EIS Standards and Guidelines, general observations, and requirements of the RCW Recovery Plan, the species would not be adversely affected by thinning the stands to 40 and 60 BA to improve the foraging and nesting habitat for the RCW. Intervals of prescribed fire on a 2-5 year basis and midstory control would promote the optimal habitat requirements needed for the species (Caldwell, 2006). Canebrake restoration activities would have no effect on RCW recovery efforts.

Alternative 2 is not likely to adversely affect the RCW. Implementation of the proposed activities would be in accordance with the ESA (Section 7), RCW EIS guidelines, RCW Recovery Plan, and the current Forest Plan for the Chattahoochee-Oconee National Forests (Caldwell, 2004).

Bachman's Sparrow

While implementation of Alternative 2 might disturb a few individuals, this effect is unlikely due to low population densities within the project area. Overall, Alternative 2 would benefit the Bachman’s sparrow by conducting vegetation control and lowering basal areas, thereby improving habitat conditions for the species within the project area (Caldwell, 2006).

Altamaha Shiner and Ocmulgee Shiner

The Altamaha Shiner and Ocmulgee Shiner are fish species found in the Altamaha Drainage. Surveys conducted by the Center for Aquatic Technology Transfer (CATT) identified Ocmulgee Shiner within Caney Creek area located east of the project area. Altamaha shiners occur in the upper Altamaha River Drainage. Their preferred habitat is rocky and sandy pools of creeks and

small rivers. This species was not detected during fish surveys done in 1995 (Caldwell, 2006). Alternative 2 will decrease vegetation within the project area, however, implementation of BMP's along with protection of the riparian corridors should not effect a change in water temperature and prevent erosion within the areas. Use of herbicides within the project areas to be thinned would not effect fisheries habitat if mitigation measures and Forest Plan restrictions are followed. Only aquatic herbicides will be used within potential areas where perennial streams are located (See Appendix F). Therefore, the Ocmulgee or Altamaha Shiner would not be impacted by implementation of Alternative 2.

3.2.1.3 Cumulative Impacts

Alternative 1

In the absence of thinning under Alternative 1, the general health of forest stands in the project area would likely decline gradually and stabilize at a new lower level. The incidence of SPB attacks would likely increase, and the potential for infected trees to spread the beetle to nearby trees on public and private lands would also increase. Since stand densities would remain at their current levels, Alternative 1 may result in significant cumulative increase in outbreaks in the project area. As a result there may be an increased necessity for SPB suppression/salvage activities to occur.

Alternative 1, however, may cumulatively result in an increase in the potential for a catastrophic wildfire within the project area. An increase in hazardous fuel loading is already occurring due to SPB outbreaks, where mature trees are either dying or being cut and left on the ground in suppression efforts. Although prescribed burning is working to reduce these hazardous fuels and the potential for a catastrophic wildfire, overstocking of the forest stand would increase under Alternative 1, contributing to an increase in the potential for wildfire.

Implementation of Alternative 1 would neither provide open forest habitat, nor create a measurable amount of additional early successional habitat. Early successional habitat would only be created in the event of pine mortality. Prescribed burning within the project area would enhance the quality of this early successional habitat. However, these impacts would be short-term, as the surrounding forest canopy would quickly close over the openings.

Under Alternative 1, forest stands within the project area would continue to mature, shading out understory vegetation and reducing the quantity of browse for various wildlife species. Prescribed fires in these areas would help to improve foraging habitat for wildlife by increasing browse production. In addition, prescribed fires in these areas would help delay succession of the forest stands to hardwoods, which have lower resistance to fires (Yahner, 2000). Although biodiversity would increase in the understory as a result of periodic prescribed burn treatments in some stands, this increase would be very slight, since the closed canopy would prevent sunlight from reaching the forest floor. Diversity in the canopy and subcanopy would likely remain at current levels under Alternative 1.

Over the longer-term, early successional habitat may be provided on recently cleared areas and in agricultural fields on private land. Depending on activities of the landowners, this type of habitat may be continually provided over the long-term if timber harvest continues on these lands in short-rotation. Lands converted to cultivated uses would provide field and edge habitat over the long-term. In areas where this private land is located adjacent to mature forested habitat, edge habitat would be created. Therefore, when combined with activities on private lands, the No Action alternative may still allow for a mosaic of habitats that would benefit a variety of different species, although open forest habitats would decline.

All Forest actions are monitored as to their effects on PETS species. The potential for pine mortality (either natural or from SPB infestations) would be greater under Alternative 1 due to poor forest health and overcrowded conditions. There would be a greater potential under Alternative 1 for SPB infestations to adversely affect RCW and Bachman's sparrow habitat. While prescribed burning would slightly enhance the quality of habitat within the project area for these species, the lack of thinning and other treatments in Alternative 1 would not increase these beneficial effects.

Alternative 2

Prescribed burning has been occurring within the project area over the past couple of decades, and would continue to occur in the future. The combined use of thinning and prescribed burns is considered optimal for maintaining an abundant source of understory vegetation for wildlife browse (Cain, 1995; Haywood et al., 1998; Schultz, 1997; USDA, 1989b). Periodic prescribed burning generally topkills most small, developing hardwood sprouts and shrubs (USDA, 1989a; 1989b; Schultz, 1997). This stimulates the growth of multiple sprouts from surviving root stocks and maintains the majority of hardwood sprouts in an optimal state for wildlife forage and cover. Yield and quality increases are often observed in herbage, legumes, and hardwood sprouts following a fire, and when combined with thinning operations that increase light penetration to the forest floor, increases would be noticeable. Further discussion of the benefits to vegetation communities associated with prescribed fire use are covered in the *Vegetation Management in the Coastal Plain/Piedmont EI*S (USFS, 1989a), and in the *Guide for Prescribed Fire in the Southern United States* (USFS, 1989b).

Low intensity prescribed fires conducted by the USFS rarely cause direct wildlife mortality, and any mortality typically has a negligible effect on wildlife populations (USFS, 1989a; Lyon et al., 2000; Landers, 1987). Impacts on wildlife from prescribed burning are primarily indirect, through effects on habitat and food sources. Prescribed fire can have temporary adverse impacts on animal populations by eliminating cover, food sources, habitat, or destroying nesting sites (Lyon et al., 2000; Schultz, 1997). However, fire can cause a short-term increase in productivity, availability, or nutrient content of forage and browse, as well as stimulate fruit and seed production (USFS, 1989a; 1989b; Schultz, 1997; Lyon et al., 2000). These improvements may, in turn, contribute to an increase in herbivore populations, and subsequently, an increase in their predators. Large carnivores and omnivores have extensive home ranges and their populations may change little in response to fire; however, they thrive where their preferred prey is most plentiful, often in areas of recent burns (Lyon et al., 2000). Prescribed fire also temporarily

opens up the understory, benefiting those species that prefer more open areas for foraging, escape, and nesting, but adversely affecting other species that require protection of dense understory growth (Landers, 1987). Prescribed fires can also increase edge effects and create habitat mosaics that contain semi-open and open conditions (USFS, 1989b). Effects of prescribed fire on aquatics are determined by fire size, intensity, severity, postfire weather, and physical, chemical and biological characteristics of individual sites. The topography, soil properties, and moisture, fuel moisture and loads, density of vegetation, type of vegetation, microclimates associated with slope, aspect, and topographic position. The Hitchiti has been managed for RCW's (since 1980's), which has included prescribed fire on a 3-5 year rotation. Burning plans are done on each area considering the topography, weather, aspect, and fuel/moisture loads. Fish surveys still show the presence of Ocmulgee shiners and many other fish species. The majority of the prescribed fires are done during the dormant season. There is not likely to be direct, indirect, or cumulative effects on the aquatic species. Cumulative effects on wildlife resulting from the combination of prescribed burning and thinning would be beneficial. There would be a greater increase in the production of herbaceous food sources within the project area, which would likely increase wildlife populations in the area.

Prescribed burning, in combination with thinning, would help to create a more mosaic forest structure, thereby increasing plant and animal species diversity. This mosaic of habitat types would be enhanced by the diversity of cover on adjacent public (deciduous and mixed forest) and private lands (forested land and fields), and by the creation and maintenance of wildlife openings under Alternatives 2. Wildlife openings favor wildlife that prefer open areas, early successional, or shrub habitat, while mature forested conditions favor forest interior species. Therefore, habitat types that would be created and/or present within and adjacent to the project area would include early successional habitat, edge habitat, open land (small amounts), mature forested habitat, and open forest habitats. When considered in a cumulative context, implementation of Alternative 2 would provide a wide array of habitat types for a variety of wildlife, including wildlife MIS, over the long-term.

Since 1991, the USFS has invested substantial time, money, and resources to aid in the recovery of the RCW within the Habitat and Sub-HMA on the Oconee National Forest. In fiscal year 2003, the Oconee Ranger District issued a Decision Memo regarding the use of prescribed burning within the HMAs and Sub-HMAs and Greene County to improve RCW habitat and other wildlife habitat. This decision involved burning approximately 18,300 acres over the next 2 years in these areas (USFS, 2003a).

Implementation of Alternative 2, in conjunction with prescribed burning, would also decrease the potential for a catastrophic fire or SPB outbreak to occur. Thinning would increase forest health and reduce crowded conditions, while burning would eliminate grounded fuels from the area, cumulatively benefiting the forest stand.

Management Indicator Species

Since Alternatives 1 and 2 would have no negative effects, on habitat for the Acadian flycatcher, pileated woodpecker, hooded warbler, field sparrow, prairie warbler, and scarlet tanager, these alternatives would not contribute to cumulative negative impacts on these species.

All Forest actions are monitored as to their effects on MIS. The potential for pine mortality (either natural or from SPB infestations) would be greater under Alternative 1 due to poor forest health and overcrowded conditions. Temporary habitat (openings, early successional areas) would be created for prairie warbler and white-tailed deer in the event of pine mortality under Alternative 1. SPB suppression and salvage cuts occurring in the area would increase the possibility for openings to be created. In addition, prescribed burning would enhance the quality of the early successional habitat created by these openings. These cumulative impacts would be short-term, however, only lasting until the forest canopy closes.

Thinning in combination with prescribed burning under Alternative 2 would benefit the RCW, white-tailed deer, and pine warbler within the project area more than thinning or prescribed burning alone. The creation and maintenance (through prescribed fire) of wildlife openings within the project area would also provide additional habitat for these species, as well as for the prairie warbler. Therefore, a beneficial cumulative impact on these species would occur as a result of Alternative 2.

Prescribed burning provides the foundation for the restoration and maintenance of the pine ecosystem upon which the RCW and many other species depend. Burning, when used effectively, has been noted to be the most efficient and "natural" way to maintain RCW habitat (nesting and foraging) in optimal condition (USFS, 2003a). Burning would reduce the midstory within the forest stands, while thinning would open up the canopy, creating open, park-like conditions preferred by the RCW.

Locally Rare Species

Since none of the alternatives would have any effects on locally rare plant, aquatic, or animal species or their habitats, implementation of any of the alternatives would not contribute to cumulative impacts on locally rare species.

Proposed, Endangered, Threatened, and Sensitive (PETS) Species

Since none of the alternatives would have any effect on the Relict Trillium, implementation of any of the alternatives would not contribute to cumulative impacts on this species.

Thinning in combination with prescribed burning under Alternative 2 would benefit the RCW and Bachman's sparrow within the project area more than thinning or prescribed burning alone. Therefore, a beneficial cumulative impact on these species would occur as a result of Alternative 2. Intervals of prescribed fire on a 2- to 5-year basis and midstory control would promote the optimal habitat requirements needed for the species. Prescribed burning would be implemented during the growing season when parameters can be met (Caldwell, 2006). Prescribed burning provides the foundation for the restoration and maintenance of the pine ecosystem upon which

the RCW and many other species depend. Burning, when used effectively, has been noted to be the most efficient and "natural" way to maintain RCW habitat (nesting and foraging) in optimal condition (USFS, 2003a). Burning would reduce the midstory within the forest stands, while thinning would open up the canopy, creating open, park-like conditions preferred by the RCW.

Thinning in combination with prescribed burning under Alternative 2 would not impact the Ocmulgee and Altamaha shiner. Management actions that would propose or create adverse effects would be those that disturb soil, potentially causing erosion and sedimentation levels to increase. Vegetation alterations within the watersheds would potentially increase water flow into streams. The Riparian Prescription included in the Revised Plan provides direction designed to maintain and enhance water quality. Therefore, plan implementation should have little potential for adverse impacts to individuals. Throughout the Oconee National Forest many private lands are currently in a degraded state due to increased development and agricultural use, making presence of quality habitats on National Forest land increasingly important to the species. Following the State BMPs and streamside management zones will minimize any disturbance to the streams and wetlands, and should prevent any impacts to fish and other aquatic species.

In addition, the removal or cutting of dense trees would result in an additional beneficial cumulative effect by stopping the spread of SPB infestations and minimizing loss of habitat.

4.0 CONSULTATION AND COORDINATION

Consultation and coordination have occurred with numerous agencies during the preparation of this EA. **Table 4-1** lists the agencies, organizations, and persons contacted for information, which assisted in identifying issues, developing alternatives, and analyzing impacts of the alternatives.

Table 4-1. Persons and Agencies Contacted

Person Contacted	Agency/Organization
Elizabeth Caldwell, Wildlife Biologist	U.S. Forest Service, Chattahoochee-Oconee National Forests, Oconee Ranger District
James Wettstead, Archaeologist	U.S. Forest Service, Chattahoochee-Oconee National Forests, Oconee Ranger District
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Ron Stephens, Forest Silviculturalist	U.S. Forest Service, Chattahoochee-Oconee National Forests
James Rickard, Wildlife Biologist	U.S. Fish and Wildlife Service, Georgia Ecological Services
W. Ray Luce, Division Director, Deputy State Historic Preservation Officer	Georgia Department of Natural Resources, Historic Preservation Division
Nathan Klaus	Georgia Department of Natural Resources, Historic Preservation Division
Larry Winslett	Georgia Forestwatch
Gary Achtemeier	U.S. Forest Service, Southern Research Station
John Moore, Forester	Georgia Forestry Commision, Brender Demonstration Forest

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